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U.S. Department
of Transportation
Federal Highway
Administration

The 1987 Estimate of the Cost of Completing the Interstate System
Instruction Manual

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In Accordance with Section
104(b)(5)(A), Title 23 U.S. Code,
Highways

January 1986

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U.S. Department
of Transportation
Federal Highway
Administration

Office of the Administrator

400 Seventh St., S.W.
Washington, D.C. 20590

January 2, 1986

IN REPLY REFER TO: HNG-13

TO: State Highway Departments
All Federal Highway Administration Offices

This manual provides instructions for preparing and submitting the 1987 estimate of costs to complete the Interstate System as presently designated. The estimate will again be limited to work needed to complete projects eligible for Interstate construction funding under the Federal-Aid Highway Act of 1981.

These instructions closely follow those used for the 1985 estimate. However, we have made a number of changes to simplify procedures by limiting the reporting requirement to segments with remaining eligible work. As in previous years, though, estimates should be based on the latest available plans and quantities, with calculations and records to substantiate the costs included. Accuracy in all respects is extremely important.

The States' estimate must be transmitted to our Washington office by August 15, 1986. It is very important that we have the estimates by then, so that we will be able to assemble the report and submit it to Congress in January 1987, as required by the statute.

The Interstate Cost Estimate is a vital document which not only tells us the cost of remaining work but also determines the amount of Interstate construction funding we will make available to each State for 2 years. We expect the 1987 estimate to be used for apportioning Interstate construction funds for fiscal years 1989 and 1990. I am certain I can count on the State highway departments and our own offices to give the 1987 estimate the conscientious attention to detail and accuracy which have characterized previous reports.

Sincerely yours,

R. D. Morgan
Executive Director

Form approved
OMB 2125-0092

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1987 INTERSTATE COST ESTIMATE HIGHLIGHTS

BASIC POLICY

The basic policy regarding Interstate construction fund eligibility is unchanged from that issued in the 1983 ICE manual. The 1981 Federal-Aid Highway Act redefinition is still in full effect and has not changed.

There have been some minor revisions to the instructions; only to clarify their meaning.

ZERO COST ROUTES AND SEGMENTS

We have again attempted to minimize reporting procedures for both zero cost routes and segments. Basically, if there is not remaining eligible cost on the route or segment, there is no data entry required on either the Table B or the Table C. Also there is no need to include either a strip map or typical cross section for the zero cost route or segment.

States with no remaining eligible Interstate construction costs may submit a minimal report of a letter indicating no remaining costs to complete.

FINANCE CODES

There is no longer any provision to report costs not eligible for Interstate construction funds in the ICE. Finance codes 12 (toll, non-FAI cost) and 24 (non-FAI costs) are no longer valid finance codes and shall not be used. Finance codes 10 (toll, zero cost) and 20 (free, zero cost) are still valid, however, they are included only for those States electing to continue reporting zero cost segments.

MICRO-COMPUTER PROGRAMS

This year, we also plan to make available a series of microcomputer programs to support the development of the ICE. These programs are still only in conceptual stage and details will be forthcoming. These programs will provide a full screen input with verification, data output for submittal, printed tables B and C, and a limited data base query system. The programs are being developed to operate on either the IBM-PC or the Victor 9000 using MS-DOS.

The programs will be able to edit and update the 1985 ICE data for the 1987 ICE. Consequently, the 1985 ICE data for each State will be available to those requesting it.

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INSTRUCTION MANUAL FOR PREPARATION AND SUBMISSION OF

THE 1987 ESTIMATE

OF THE COST OF COMPLETING THE INTERSTATE SYSTEM

JANUARY 1986

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I - GENERAL INFORMATION AND CONTROLS

Introduction

This manual is issued to establish uniformity in estimating procedures among the States. It supersedes the Instruction Manual dated March 1982, updated in 1984 which prescribed the procedures to establish factors for apportionment of Federal-aid Interstate System funds authorized for the fiscal years 1987 and 1988.

The objective is to obtain for each State a revised estimate of the total cost to complete the portion of the Interstate System in that State. Factors will be established to be used for the apportionment to the States of the Federal-aid Interstate construction funds for fiscal years 1989 and 1990, as prescribed and authorized by Title 23, United States Code, Section 104(b)(5)(A), as amended.

The State highway departments and the Federal Highway Administration should assign well qualified and sufficient personnel to complete this study within the time limits set by the Congress.

Excerpts from Title 23, U.S.C., Section 104(b)(5)(A)

Title 23, U.S.C., Section 104(b)(5)(A), as amended, provides in part that the Secretary of Transportation, in cooperation with the State highway departments, shall make a series of detailed estimates of cost of completing the currently designed Interstate System. The estimates of cost are to be based upon standards as provided under 23 U.S.C. 109(b), as amended, (and within the limitations of Section 4 of the 1981 act) and in accordance with the rules and regulations adopted by the Secretary and applied uniformly to all the States. The estimates are to be transmitted to the Senate and the House of Representatives by the Secretary.

Each estimate of cost shall take into account all previous apportionments made. Upon approval of each estimate by the Congress, the Secretary shall use the Federal share of such approved estimate in making apportionments for the fiscal years for which the approved estimate is applicable.

Federal-Aid Highway Act of 1981 - General Overview

On December 29, 1981, the 1981 Federal-Aid Highway Act was enacted. Section 4(b) of the act established a new definition for the eligibility of regular Interstate construction funds authorized by Section 108(b) of the Federal-Aid Highway Act of 1956 and apportioned according to Section 104(b)(5)(A) of Title 23, U.S.C. Section 4(c) of the act amended Section 104(b)(5)(A) of Title 23, U.S.C., to provide that the 1983 estimate and subsequent estimates . . ."shall include only those costs eligible for funds authorized by subsection (b) of Section 108 of the Federal-Aid Highway Act of

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1956, as amended, including the amendments made by Section 4 of the Federal-Aid Highway Act of 1981." Section 4(b) of the 1981 act is reproduced below:

4(b) Subsection (b) of Section 108 of the Federal-Aid Highway Act of 1956, as amended, is further amended by adding at the end thereof the following:

"Effective on and after the date of enactment of this sentence, the obligation of funds authorized by this subsection, except for advance construction interstate projects approved before the date of enactment of this sentence, shall be limited to the construction necessary to provide a minimum level of acceptable service on the Interstate System which shall consist of

(1) full access control;

(2) a pavement design to accommodate the types and volumes of traffic anticipated for the 20-year period from date of authorization of the initial basic construction contract;

(3) essential environmental requirements;

(4) a design of not more than six lanes (exclusive of high occupancy vehicle lanes) in rural areas and all urbanized areas under 400,000 population, and up to eight lanes (exclusive of high occupancy vehicle lanes) in urbanized areas of 400,000 population or more as shown in the 1980 Federal census; and,

(5) those high occupancy vehicle lanes (including approaches and all directly related facilities) included in the interstate cost estimate for fiscal year 1981.

The obligation of funds authorized by this subsection shall be further limited to the actual costs of only those design concepts, locations, geometrics, and other construction features included in the 1981 interstate cost estimate, except in any case where the Secretary of Transportation determines that a provision of Federal law requires a different design, location, geometric, or other construction feature of a type authorized by this subsection.

For purposes of this subsection, construction necessary to provide a minimum level of acceptable service on the Interstate System shall include, but not be limited to, any construction on the Interstate System which is required under a court order issued before the date of enactment of this sentence."

The 1987 Interstate Cost Estimate will contain only those estimated costs for items of work that are eligible for Interstate construction funds under the above redefinition of eligibility. Detailed guidance and instructions for determining eligibility is provided in Chapters II and V of this manual.

Certain types of work not eligible for Interstate construction fund participation are eligible for 4R funding. Work to be funded with Interstate 4R funds shall not be reported in this estimate.

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Except as noted in the seven categories highlighted below, the 1981 act precludes Interstate construction funding for work on open to traffic sections. Work on these sections such as added interchanges, safety upgrading, new added lanes, bridge deck protective systems, modification to provide added bridge clearance, and added environmental features is not eligible for Interstate construction funding and shall not be included in this estimate. On FAI built sections where added mixed lanes or HOV lanes are eligible, any work beyond that necessary and incidental to construction of the lanes is not eligible for Interstate construction funding. This type of work is eligible for Interstate 4R funding.

The construction work (projects) eligible for Interstate construction funds is specifically limited to the types of projects or construction elements highlighted below:

- o Essential work necessary to complete gap sections (Finance Code 22).
- o Essential major upgrading approved under FHPM 6-3-2-4 on incorporated segments built without Interstate funds and included in the 1981 estimate (Finance Code 23).
- o Stage construction approved and identified at the time of initial authorization (Finance Code 21).
- o High occupancy vehicle (HOV) lanes approaches and directly related facilities approved and included in the 1981 estimate. On FAI built sections this includes only the construction of the lanes and necessary incidental work (Finance Code 25).
- o Approved added mixed traffic lanes included in the 1981 estimate. On FAI built sections this includes only the construction of the lanes and necessary incidental work (Finance Code 25).
- o Essential environmental requirements found necessary on gap sections or as part of approved major upgrading on incorporated sections or as approved stage construction (Finance Code 21, 22, or 23).
- o Remaining phases of initial construction work on open to traffic sections necessary to bring a section to a minimum level of acceptable service (i.e., minimum of four lanes, full access control, completion of signing and other phases of initial construction and work to tie into adjacent gap sections) (Finance Code 22).

The 1981 act also limited the number of lanes that may be constructed using Interstate construction funds. Except as allowed in Section II on gap sections in preliminary status of design development, the number of lanes to be constructed with Interstate construction funds is limited to those included in the 1981 estimate and within the number allowed by the 1981 act.

The 1981 act limits Interstate construction funding to previously approved work included in the 1981 estimate. This design concept and location limitation does not apply to routine geometric or other design refinements which results from normal design development as is further discussed under "Major Design Revisions."

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Changes in design concepts, locations, geometrics and construction features to be constructed with Interstate construction funds from those shown in the 1981 estimate shall be limited to changes on gap sections and on approved major upgrading of incorporated sections. Such changes in design concept, location, geometrics and construction features from the 1981 estimate may only be approved if it is determined a change is required by a provision of Federal law. This is discussed under "Major Design Revisions."

For the purposes of redefinition of construction eligibility, essential work means that work necessary to construct and open a section of the System and to provide a minimum level of acceptable service. Essential work typically includes items such as: essential environmental requirements, grading and drainage, pavement structure, grade separations, interchanges, bridges, traffic control devices, fencing, and signing and pavement markings.

Essential environmental requirements are eligible as part of gap construction, and major upgrading on incorporated sections. This work includes measures or features necessary to mitigate specific environmental impacts of the project as identified in the project documents.

Only the costs for work determined to be eligible under the above completion redefinition and as specifically discussed in later chapters can be included as eligible costs in the 1987 estimate. Work which has shifted to the 4R program shall not be reported in this estimate.

Essential Environmental Requirements

In consideration of the continuing national interest in the social, economic and environmental (SEE) effect of all public works projects, the estimates prepared for all Interstate highway segments which are gap segments or incorporated segments with approved major upgrading should reflect, within the limitations provided elsewhere in this manual, essential environmental requirements. Essential environmental requirements are designs and features necessary to mitigate specific adverse environmental impacts which actually result from a project's undertaking, and normally do not include environmental enhancement.

Examples of essential environmental requirements could include noise abatement measures required specifically to reduce noise levels, erosion control measures, measures to minimize impacts on wetlands and Section 4(f) properties including replacement of parklands, location changes caused by alignment shifts to avoid parks or historic sites, and pedestrian facilities across Interstate main line or ramps necessary to maintain existing access.

To be eligible for Interstate construction, essential environmental requirements must:

(1) be on a gap segment or an incorporated segment with approved major upgrading, and must

(2) have been included in the 1981 estimate or be determined (by FHWA Headquarters) to be required by a provision of Federal law or a court order issued prior to the 1981 act.

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Features that were eligible under Title 23 prior to enactment of the 1981 act that are no longer eligible for Interstate construction funds are eligible for Interstate 4R funds.

Accordingly, for those Interstate segments for which the environmental document has been approved since the 1985 estimate was prepared and construction has not yet been authorized, the Division Administrator shall review the environmental document to determine (a) if each environmental element or feature is essential to mitigate specific adverse environmental impacts with a minimum acceptable level of mitigation, and (b) to ascertain if all of the identified essential environmental requirements were included in the 1981 estimate. When it is determined, as a result of this review, that the essential environmental requirements in the environmental documents satisfy (a) and (b) above, the costs may be included in this estimate. If it is determined that the proposed environmental elements to be incorporated into the project plans require a design concept, location, geometric or other construction feature different from that shown in the 1981 estimate, such proposed change must be submitted to the Washington Headquarters for review and approval before inclusion in this estimate. These changes are discussed in the next section "Major Design Revisions."

Major Design Revisions (Limitations to the 1981 Estimate)

Locations, design concepts, geometrics and other construction features on sections having eligible work under the 1981 act redefinition and approved for inclusion in the 1981 estimate may be included in this estimate without additional documentation provided the control conditions under which they were approved still apply. The work must still be feasible and cost effective. In addition to their eligibility there must still be a genuine need for the design elements and the work.

This limit on the extent of changes in design concept, location, geometrics and construction features applies to all sections of the System where eligible work has been identified in the 1981 estimate. These are gap sections, incorporated sections built without Interstate funds that have major upgrading approved (and in the 1981 estimate), sections where approved stage construction is identified, and sections where HOV or other added lanes in the 1981 estimate are still justified and eligible.

The 1981 act also provides an exception to the above 1981 estimate limitations where the Secretary determines that Federal law requires a different design, location, or geometric feature than that included in the estimate. This exception is applicable to gap or incorporated sections. This exception was provided in recognition that some Interstate segments, when included in the 1981 estimate, were at preliminary stages of development. Subsequent project development activities, including environmental impact analyses, may conclude that a different design, location, or construction feature eligible under Section 108(b) (such as to avoid a park or historic site) is justified or required under a specific Federal law. After an approval of a design concept exception is given by FHWA Headquarters, the costs for the changed concept may be included in the estimate. The costs for design concept changes not required by Federal law are not eligible and shall not be included in this estimate as eligible costs.

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Application of the limitation to the 1981 estimate is discussed below:

Design Concept Revisions - The 1981 act limits Interstate construction funding to previously approved design concepts included in the 1981 estimate (except for routine design refinements discussed later). Unless an exception is granted by FHWA Headquarters, only the costs for work necessary to construct the design concepts in the 1981 estimate can be included in this estimate.

A change in design concept means major revisions such as changing to a viaduct section instead of embankment or adding costs for additional walls, and grading and drainage systems required to build a depressed highway concept instead of a viaduct or ground level concept. The addition of interchanges where none were shown before is also a change in design concept. Routine design or geometric refinements which result from normal design development are not design concept changes. These refinements typically consist of items such as added widths and spans on bridges, revisions to interchange layouts, wall extensions, added noise wall length, etc. Costs for routine changes and changes in concept which result in a reduced cost of the project (such as eliminating interchanges, reducing the number of lanes and other downscoping) may be included in the estimate without the above documentation.

Location Revisions - Some Interstate segments were in preliminary stages of development at the time of the 1981 estimate. Subsequent project development activities, including environmental impact analysis, may conclude that a different design or location (such as to avoid a park or historic site) is justified or required under a specific Federal law. Costs for changes from the locations shown in the 1981 estimate cannot be included in this estimate unless an exception is granted by FHWA Headquarters.

Geometric Changes and Added Construction Features - Changes from the basic geometric design used for the 1981 estimate or inclusion of construction features not included in the 1981 estimate cannot be included in this estimate unless an exception is granted by FHWA Headquarters. This limitation does not apply to routine geometric or other design refinements which result from normal design development. These refinements could consist of items such as added widths and spans on bridges, revisions to interchange layouts, wall extensions or minor refinements in alignment.

Distribution of Responsibilities for Estimating, and Time Schedule for Submission of Reports

The Office of Engineering of the Washington Headquarters of the Federal Highway Administration is responsible for the overall policies governing preparation of the estimate, for arranging and providing consultation with the field offices by representatives from other Headquarters offices, for review of submitted data, and for assembly of the entire report for submission to the Secretary of Transportation not later than December 15, 1986.

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Region and division offices of the Federal Highway Administration are to present this instruction manual to each State highway department and are to consult, guide and work with the departments on all matters pertaining to estimating and reporting. The FHWA division offices are to verify that the design concepts and locations used for estimating are those contained in the 1981 estimate unless an exception has been approved in accordance with the provisions of Section 4(b) of the 1981 act (discussed on page I-6); that the designs or preliminary plans used for estimating purposes are in compliance with approved standards and the other applicable controls; and that the detailed estimate of costs for the work is reasonable, supportable, complete, accurate and has been developed in accordance with these instructions. The FHWA division offices are responsible for having the estimates and forms completed and submitted to Washington not later than August 15, 1986.

The State highway departments, in collaboration with the Federal Highway Administration, are to estimate the costs and complete the reports for the Interstate System routes within the States' boundaries in accordance with the principles and instructions outlined herein.

The Regional Federal Highway Administrator has overall responsibility for the coordination at State line connections within his region, and in cooperation with adjoining Regional Federal Highway Administrators shall be responsible for any necessary coordinating effort at State lines which are regional boundaries, enlisting the cooperation of the Washington Headquarters where necessary.

Other supplemental reports required in support of the estimate include the Region and Division Office narratives, FHWA and State Person-Hour and Cost Report, and the Cost Change Analysis. These shall be submitted to Headquarters by September 15, 1986. Detailed instructions regarding these reports will be issued separately from this manual.

System to be Estimated

The Interstate System totals 42,500 miles plus the mileage added for substitute routes under the provisions of the Howard-Cramer Amendment (23 U.S.C. 103(e)(2)), and the mileage added under 23 U.S.C. 139 (nonchargeable mileage for which there is to be no Interstate financial responsibility).

The basic 42,500-mile System is made up of the 40,000-mile System provided in the original authorization, Section 7 of the Federal-Aid Highway Act of 1944, the 1,000-mile expansion provided in the Federal-Aid Highway Act of 1956, Section 108(1), and the 1,500-mile expansion provided in the Federal-Aid Highway Act of 1968, Section 14b.

The portion of the System to be estimated shall include those designated routes approved by the Federal Highway Administration in accordance with 23 U.S.C. 103(e). Segments designated under Section 139(a), (b) and (c) shall not be estimated. Minimum reporting requirements for States with either no remaining eligible costs or routes and route segments with no costs are discussed later in the manual.

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Route Location and Design Concept to be Estimated

The route location and design concept to be estimated shall be the same as was used for the 1981 Interstate Cost Estimate. The only exception is in cases where the determination is or has been made that a provision of Federal law requires a different design concept, location, geometrics or other construction feature of the type eligible under Section 108(b). Changes from the design concepts or locations on which the 1981 estimate was based must be approved by FHWA Headquarters. Further detailed discussion is provided in this manual under "Major Design Revisions."

Establishment of the Base Level of Development for Estimating the Work and the Cost Necessary to Complete the Interstate System

In making the 1987 estimate all work for the improvement of the Interstate System routes which was in authorized and fully financed status (as distinguished from the work in temporarily financed status as covered later in this paragraph) as of December 31, 1985, regardless of how financed, is carried through to completion under the financing arrangements then in effect, and the costs for such work shall not be included in the estimate. There are three types of temporarily State financed and authorized work which may subsequently be financed largely with Interstate construction funds:

1. Interstate Bond Projects (23 U.S.C. 122),

2. ACI Projects (23 U.S.C. 115),

3. Right-of-Way Advance Acquisition Revolving Fund Projects (23 U.S.C. 108(c)).

These three categories (Bond, ACI, and Advance Acquisition Projects) are to be included in this estimate (Table D) as directed in Section V.

In determining the level of development to be used as a base for the additional work necessary to complete the Interstate System, it shall be assumed that all work in authorized and fully financed status as of December 31, 1985, including minor overruns and underruns on authorized work, has been accomplished. Portions of projects that have not been authorized may be included in the estimate if eligibility for Interstate construction funds is established under the redefinition in the 1981 act. Major supportable overruns on authorized construction work may be included in the estimate on a project by project basis and only where there is supportable evidence in the State's files that there will be a major overrun on the project. Methods of developing preliminary engineering and right-of-way estimates (including major overruns) are discussed in Section V.

The determination as to when work was ". . .in authorized and fully financed status as of December 31, 1985 . . ." shall be based on fiscal accounting records of that date and shall be made as follows:

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(a) Preliminary engineering and right-of-way projects: If a State has been authorized to proceed with preliminary engineering or right-of-way work and the Federal funds have been obligated. (Federal Interstate funds are not obligated on Advance Acquisition projects until they are converted.)

(b) Construction projects: If a State has been authorized to advertise for bids and Federal funds have been obligated. (Federal funds are not obligated on ACI or Bond projects until they are converted.)

A tabulation of all Federal-aid Interstate projects in authorized status as of December 31, 1985, as shown in fiscal accounting records of that date, will be prepared in the Washington Headquarters and sent to the division offices for verification and reference.

Interstate System Resurfacing Transfers

The Surface Transportation Assistance Act of 1982, in Section 116(b), permits the transfer of up to 50 percent of the Interstate construction apportionment to the funds apportioned to Interstate 4R program. An amount equivalent to the transferred amount is removed from the Interstate cost estimate by deleting the cost-to-complete work on open-to-traffic segments as designated by the State in their transfer request. The work made ineligible for Interstate construction funding and dropped from the estimate as a result of the transfer shall not be included in this or subsequent estimates.

Completing the System

The phrase ". . . completing the Interstate System . . ." means bringing the routes of the Interstate System from their base level of development as defined herein to the status of an integrated environmentally acceptable network of fully controlled access highways on the location approved for these routes with all sections adequate to accommodate safely and efficiently the types and volumes of traffic forecast for the applicable design year, as indicated under 23 U.S.C. 109(b) as amended, and as further discussed below.

This estimate is to be based on the stage of development which will accommodate on a single highway, to the extent feasible, the traffic anticipated in the applicable design year in conformance with the approved standards. Control of access must be acquired for all sections. Construction may be performed in stages.

Title 23, U.S.C., 109(b), as amended by the Federal-Aid Highway Act of 1966, provides that all sections of the Interstate System shall have a minimum of four lanes. (Exceptions are provided in Sections 121 and 158 of the Federal-Aid Highway Act of 1973 and Section 152 of the Federal-Aid Highway Act of 1976.) Accordingly, ". . . completing the Interstate System . . ." means that those sections of the Interstate System which have been constructed as two-lane, two-directional facilities, and are not identified as exceptions to 23 U.S.C. 109(b) are to be further constructed to provide a divided facility

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with a minimum of four lanes regardless of the traffic forecast in the appropriate design year. The costs for essential work on such additional construction (on already constructed two-lane sections) as well as the costs for construction of a divided highway with a minimum of four lanes on sections yet to be constructed (and not identified as exceptions) are to be included in this cost estimate.

The costs shown in the 1987 estimate will be separated by finance code into four basic categories for eligible work.

(a) Gap construction (including completion of two-lane segments) - The initial essential construction eligible in accordance with the 1981 act redefinition which is necessary to open the facility to a minimum level of acceptable service. Also included are the final phases of initial construction work necessary to bring a project to a minimum level of acceptable service. See also page I-3. (Finance code 22)

(b) Approved essential major upgrading work eligible in accordance with the 1981 act redefinition on existing highways incorporated into the System under 23 U.S.C. 103 to the extent necessary to open the improved segment to a minimum level of service. (Finance code 23)

(c) Approved stage construction identified and approved at time of initial PS&E approval as part of the ultimate design if the work is considered necessary to open the facility to a minimum level of acceptable service. (Finance code 21)

(d) Construction of additional approved mixed traffic lanes and HOV lanes and associated HOV facilities on FAI built, open to traffic, segments. (Finance code 25)

(e) Work not eligible for Interstate construction funding which will be performed with other than Interstate construction funds. This work shall not be reported in this estimate.

The design basis and detailed reporting procedures for these categories are discussed later in Sections II, IV, and V.

Determination of Design Year and Design Year Traffic Forecast

Section 109(b), Title 23, U.S.C., as amended, prescribes in part that the geometric and construction standards for construction of the Interstate System shall be adequate to accommodate the types and volumes of traffic forecast for the design year.

All sections of the Interstate System should be developed in reasonable conformity with approved geometric and construction standards for the applicable design year. The design year for work approved for FAI participation within a section shall normally be 20 years later than the date of authorization by FHWA of the initial basic construction. The predicted year of construction will not be binding upon either the State or FHWA. Design years are to be developed as discussed beginning on page II-1.

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Segment-by-segment forecasts will be needed only for estimate sections where eligible work is to be included in the estimate. For these sections traffic volumes estimated for the 1985 estimate may be used except where changes have occurred as outlined below:

Forecasts needed to be updated if: (1) the route has been relocated through further project development so as the change its traffic characteristics; (2) the construction date has been rescheduled, thereby changing the design year; or (3) if changes in anticipated traffic patterns in the corridor have taken place which influence the traffic forecast included in the 1985 estimate.

In those cases where segment-by-segment forecast updates are necessary, all available data on existing traffic and future trends, particularly the results from comprehensive urban and statewide planning studies, should be used. Regardless of the method of developing segment-by-segment traffic estimates, these values will require review and adjustment to achieve consistency with values for other sections, statewide forecasts, and established trends on section of substantial Interstate mileage new open to traffic. When the volume of traffic forecasted for a given route exceeds the volume that can be accommodated by an environmentally acceptable, economical, practical, safe and sound engineering design for the Interstate highway, the excess traffic must be accommodated by other streets or highways, and any work for provided such streets or highways, and any work for providing such streets or highways is not to be considered a part of completing the Interstate System.

Additional statements regarding design year and traffic forecasts given in Section IV explain the entries to be made in the top half of Table B.

Toll Facilities

Toll roads, toll bridges, or toll tunnels that are approved as part of the Interstate System may be estimated in a manner similar to that used for public highways on the Interstate System. However, unless the costs for improving the toll sections are eligible under the redefinition of Interstate System completion contained in the 1981 act and the provisions of 23 U.S.C. 129 or Section 143 of the Surface Transportation Assistance Act of 1978, as amended, they will not be included in the cost estimate. If a section is eligible under the above references it should be so footnoted. Costs for upgrading toll facilities scheduled to become free in the future are not eligible for inclusion in the estimate.

Safety Upgrading of Existing Facilities

Experience gained from operation of freeways has indicated the need to either correct some elements already constructed or to add essential elements to work already constructed to provide a higher level of safety for the users of some estimate sections. The cost of such corrections or additional elements to provide a higher level of safety are eligible for 4R funds or primary funds as part of the post-Interstate construction program. Since these costs are not eligible for Interstate construction funds they shall not be shown in the estimate.

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Upgrading Existing Facilities

Many existing highways or freeways which were incorporated into the Interstate System on the basis that they met the standards current at the time have been examined to determine if they are adequate to serve current traffic. Where such sections have been clearly found to be structurally or geometrically inadequate to serve current traffic and where there has been no regular FAI participation in initial construction or major upgrading, Interstate construction funds may participate in "one time" construction to upgrade the section. For eligibility under the 1981 act and inclusion in this estimate, the major upgrading on these sections must have been approved by Headquarters in accordance with FHPM 6-3-2-4, EXPENDITURE OF FEDERAL-AID INTERSTATE FUNDS ON COMPLETED SECTIONS OF THE INTERSTATE SYSTEM and must have been included in the 1981 estimate in concept. To the extent feasible, after consideration of the social, economic, and environmental impacts, the section should be designed to provide traffic service compatible with adjacent highway sections and to provide a safe, adequate facility for a design period as described in Section II.

On existing incorporated sections the costs to construct additional interchanges that were included as eligible for FAI funding in the 1981 estimate are eligible for Interstate construction funds (and inclusion in the estimate) if such added interchanges were approved by the Washington Headquarters as eligible for Interstate construction fund participation as part of an initial major upgrading project. Other additional interchanges requests on open to traffic sections will still be considered by Headquarters and if approved must be constructed with other than Interstate construction funds.

The eligibility of Interstate construction fund participation in the costs for any approved major upgrading work on incorporated sections and its inclusion in the 1981 estimate is an important but not the sole criterion for their inclusion in this estimate. In addition to their eligibility, there must be a genuine need for such work, the work must be feasible and cost effective, and there must be a serious intent by the State to perform the work within the life of the program. The work should be coded Finance Code 23.

Any difference between a State highway department and an FHWA Division Administrator regarding any of the above items of work are to be resolved by the Regional Federal Highway Administrator, or as the latter may request, by the Federal Highway Administrator.

Estimates of Cost of Work to Complete the System

A detailed estimate is to be prepared for each State for remaining work necessary to complete those routes comprising the presently designated System. These instructions provide for minimum reporting requirements in all States; no report is required in States with no remaining eligible costs and only route sections with remaining eligible work will be estimated. Further details are presented later in Section IV.

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The character and the extent of the work to be undertaken after December 31, 1985, to complete the System as redefined by the 1981 act is to be estimated in each State by the State highway departments in collaboration with the Federal Highway Administrator. General information regarding this work is to be reported in Table B and shown by typical cross sections and strip maps as described in Section IV.

The estimate of total cost to accomplish this work, is to be computed and reported by each State on Tables B and C, as described in Section V.

Procedures to Obtain Apportionment Factors

The estimate of total cost to accomplish the work needed to complete the presently designated Interstate System is to be summarized by the Federal Highway Administration from Table C for each State, and reported to the Congress as described in Section VI. The State estimates, as summarized from their Table C, may be modified by the Secretary of Transportation upon the recommendation of the Federal Highway Administrator.

The data in Table 5, described in Section VI, constitutes the ultimate objective of this study, namely, the establishment of the factors to be recommended to the Congress for use to apportion the Federal-aid Interstate construction funds authorized for the fiscal years 1989 and 1990.

Tables 3 and 4 will also be prepared by the Federal Highway Administration as discussed in Section VI. The estimated total cost to complete the Interstate System and deductions in each State, will be reported on Table 4. The deductions in Table 3 will be the balance of Federal-aid Interstate construction funds available and is the sum of all Interstate construction funds apportioned and allocated prior to January 1, 1987 (for the fiscal years ending June 30, 1954, through October 1, 1987), plus the apportionment, and allocation, if made, of Interstate construction funds for fiscal year 1988 less the obligations against these monies for specific Interstate projects authorized by the Federal Highway Administration through December 31, 1986. The funds available will also reflect adjustments for reductions in unobligated balances due to withdrawals under 23 U.S.C. 103(e)(4) and transfers under 23 U.S.C. 119(d). Unobligated Interstate funds will not include 1-1/2 percent HPR funds.

The total estimated cost of work to be undertaken after December 31, 1985, in a State (adjusted for Interstate Bond, ACI and Advance Acquisition Projects and as modified by the Secretary of Transportation upon the recommendation of the Federal Highway Administrator), less the total of all deductions for that State, represents the estimated cost for work necessary to complete the presently designated Interstate System with funds to be apportioned for 1989 and 1990 and subsequent fiscal years. The ratio of the Federal share of this remaining total estimated cost in any State to the Federal share of the sum of these remaining estimated costs in all States will constitute the apportionment factor to be presented to Congress for approval for use in apportioning funds authorized for fiscal years 1989 and 1990. The Federal share shall be 90 percent in all States except for those that qualify for an increase in Federal pro-rata because of public land areas as provided by 23 U.S.C. 120(c).

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Standards

A fundamental standard for design is that there shall be control of access for all sections of the Interstate System. This and other standards are set forth in the GEOMETRIC DESIGN STANDARDS FOR THE NATIONAL SYSTEM OF INTERSTATE AND DEFENSE HIGHWAYS adopted by the AASHTO and approved by FHWA, in FHPM 6-2-1-1, DESIGN STANDARDS FOR FEDERAL-AID PROJECTS, and in FHWA Memorandums and Notices as cited hereinafter under Section II.

Section 5(a) of the Federal-Aid Highway Act of 1966 amended 23 U.S.C. 109(b) to specify that the Interstate System standards shall in all cases provide for at least four lanes of traffic. This minimum four-lane requirement may, however, be waived for special purpose facilities proposed under 23 U.S.C. 142(b) and for the Interstate segments described in Section 158 of the Federal-Aid Highway Act of 1973 and Section 152 of the Federal-Aid Highway Act of 1976.

Extent of Plans for Work to be Estimated

This is the final estimate required under current law and in most instances the development of project plans is well underway for the remaining eligible work. Accordingly, this detailed estimate of the cost to complete the Interstate System should be made from final PS&E plans to the extent these are or can be made available.

As a minimum for all other work, the estimate should be based on preliminary plans and preliminary layouts of all major structures and interchanges so that accurate quantity estimates can be made. The base data prepared for this estimate by the State highway departments shall be retained by them for future reference.

The latest available plans, showing the right-of-way limits and areas to be estimated, shall be made available for use in estimating the costs of right-of-way and relocation payments and services.

Quantities and Unit Costs

Entries on the estimate forms to be submitted are for overall costs only, without detail of estimated quantities or unit prices.

Reasonably accurate quantity estimates are to be developed by the State highway departments.

The unit prices to be used for the construction estimate must be developed from low bid weighted averages for comparable items and influences and be based on or representative of Interstate contracts awarded during calendar year 1985. Contracts for primary system work which is comparable in scope, work type, standards, etc., to Interstate work may be included with Interstate contracts in developing unit prices.

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Unit prices should be developed which are directly applicable to the individual sections being estimated. Low bid price data should be sought from each area where construction work remains. When a State lacks adequate price experience for an area, prices from a comparable area or statewide weighted averages adjusted with an appropriate index may be used.

States which are reasonably homogeneous with respect to regional, geographical, economic, rural and urban influences and in which past price experience indicates that statewide averages would be representative of prices in all areas, may use statewide averages for all remaining work in the State.

There may be instances where low bid experience for some or all required items is not available or is inadequate within a State for the base year specified. In such cases, low bid data may be obtained from (1) an adjacent comparable State or comparable area within that State or (2) price data for a year other than the calendar year 1985 but adjusted to the base year. Price indices used for such adjustments must be supportable and documented in the State's records. An index developed along the lines of the FHWA Construction Cost Index could be used for these adjustments. If a State has any questions concerning the development of an index, the FHWA Washington Headquarters is available to provide the necessary information. In no instance may early 1986 contract prices be used in the development of estimate unit prices without an appropriate adjustment to the specified base year. Likewise, in no instance, may any total contract cost from contracts awarded in 1986 be used directly in the estimate.

Any deviations from the above unit price procedures must have Washington Headquarters approval. All unit prices used for this estimate shall be reviewed and when found acceptable, approved by the FHWA Division Administrator.

Right-of-Way and Relocation Assistance Estimate

A complete estimate of all eligible and remaining right-of-way and relocation assistance needs shall be prepared by or under the supervision of the State highway department. These needs shall reflect the acquisition and relocation policies and requirements as provided in Title 23 and/or the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

Although formal appraisals are not required, the right-of-way property value estimate shall be prepared on a parcel by parcel basis by a qualified appraiser. In addition, an estimate shall be made of the cost of the incidental expenses connected with right-of-way acquisition and an estimate of the amounts by which administrative and legal settlements and court awards may be expected to exceed the review appraiser's estimate of fair market value. The right-of-way estimate shall also include costs for demolition and clearing of improvements.

Details for developing and reporting the individual estimate amounts for both right-of-way and relocation needs are covered in Appendix B and in Section V of this manual.

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Utilities

The estimate shall include costs of all necessary utility adjustments. The location and manner in which utilities are to be accommodated on the Interstate highways is to be in conformance with the provisions of FHPM 6-6-3-2, ACCOMMODATION OF UTILITIES dated September 6, 1985. The utility costs to be included in this estimate are to be those indicated as eligible for FAI participation in FHPM 6-6-3-1, UTILITY RELOCATIONS, ADJUSTMENTS, AND REIMBURSEMENT dated September 6, 1985.

State Records

The worksheet records of the State are to be complete including data relative to right-of-way as well as that relating to design and construction. The records shall be in such detail that the State can readily establish from such records the costs as estimated for preliminary engineering, for right-of-way, and for construction of any section or portion of a section. The necessary estimate sections to be adopted to accomplish this purpose are covered later under Section IV, Establishment of Estimate Sections, in this manual.

The State highway departments shall retain, as established in FHPM 1-6-2, RECORDKEEPING AND RETENTION REQUIREMENTS, all their worksheets for future reference to support and justify the estimate as submitted, should questions arise, and to aid in the preparation of other reports the Federal Highway Administration is required to prepare from time to time with the State highway departments. Such worksheets are to be made in clear form and shall be available for review by the Department of Transportation as represented by the Federal Highway Administration, and the Committees of the Congress at their request.

Data Processing

Instructions for data processing are included in Appendix A of this manual. Data from Table B may be submitted in any of three forms: 1) punched and interpreted data cards, 2) magnetic tape, or 3) diskettes.

FHWA Headquarters will distribute an edit program, as in the past, to States requesting it.

Included in the edit program package will be a "Table B Print Program" and a "Table C Print Program." The edit program has been modified to calculate values for lines 16, 17, 18, and 19. Any values put in will be replaced by machine calculated values and if the calculated value is different will be flagged by the edit program. A percentage for engineering and contingency in line 17 must be specified by the users. In addition, the program will provide an output field for line 11 (typical cross section reference).

The Table B Print Program will generate a Table B using data processing equipment.

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A Table C Print Program has been developed which will generate Table C using the edited Table B data.

In addition for States wishing to use microcomputers, a battery of microcomputer programs will be made available to aid in the preparing, editing, and printing of tables in the estimate. Details on this battery of programs, to be made available upon request, are the subject of a separate guidance memorandum.

State Highway Department Reports

Each State's report other than those with no remaining costs shall contain the following material in the order shown. The reports may be printed on both sides of the sheet (sections of this manual referred to are in parenthesis):

States with no remaining eligible Interstate construction costs may submit a minimal report; a letter indicating they have no remaining costs.

Figure 1. Signature sheet. (Page I-19)

Figure 2. Map of general location of presently designated Interstate System routes (Section III, page III-4), showing the official route numbering.

Table A. Route descriptions (Section III).

Typical Cross Sections (Section IV). (Only required for routes or sections with remaining costs.)

Table B. Design classification by estimate section (Section IV). (Only required for routes or sections with remaining costs.)

Table B. Cost estimates by estimate sections (Section V). (Only required for routes or sections with remaining costs.)

Strip Map of Route Location (Section IV). (Only required for routes or sections with remaining costs.)

Table C. Cost estimate of all routes - Includes only those costs eligible for Interstate construction funding (Section V).

Table D. The most accurate cost available at the "closing of the books" on the estimate of Interstate Bond, ACI and Advance Acquisition Projects, as of December 31, 1985.

The assembly of Table B and strip maps should be in that order in the final report by route number.

Eight copies of the State's report are to be assembled in durable covers and furnished to the FHWA by the State highway departments; three to the Washington Headquarters, two to the regional office, and three to the division office. Reports shall be submitted to Washington Headquarters by August 15, 1986.

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For uniformity in the material to be presented to the Congress, the State report of the Interstate estimate shall be an assembly of table sheets that are 11 inches by 14 to 20 inches in size and strip map prints folded for assembly to the same size. The material should be assembled in logical order, fastened on the left edge, and enclosed in a durable flexible cover not over 12 inches by 21 inches in size. Sheets longer than 20 inches should be folded so as to open to the right with identification added or showing at the right edge. The tables and maps are to be prepared as follows:

State map: on single 11 by 14 to 20-inch sheet with urban inserts appropriately located in the margins or on a separate sheet.

Tables A and D: on a single or series of 11 by 14 to 20-inch sheets.

Tables B and C: on 11 by 14 to 20-inch sheets, not folded, each of which would have complete identification, heading, and series numbering. Totals are to be on the last sheet for each route.

Strip map: print sheets 11 inches wide and 4 to 6 feet long, folded to 11 by 14 to 20-inch size, each of which is to have complete identification and series numbering. Individual map sheets 11 by 14 to 20 inches are acceptable in lieu of folded sheets.

The report shall also include a signature sheet which verifies that the Interstate Cost Estimates have been prepared under the general supervision of experienced and competent engineers who have made sufficient checks to be informed as to the details involved. The signature sheet (see figure 1, below) shall be signed by the responsible engineering officials of the State highway department and the FHWA Division Administrator.

The following title is to be shown on the cover of the report:

1987 Estimate

of the Cost of Completing

The National System of Interstate and Defense Highways

In the State of _____

August 15, 1986

(Data as of December 31, 1985)

Prepared by (State) Highway Department
In Cooperation with the Federal Highway Administration

Department of Transportation

in accordance with

Section 104(b)(5)(A), Title 23, U.S.C., Highways

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This 1987 estimate of the cost of completing the National System of Interstate and Defense Highways in the State of _____ as of December 31, 1985, was prepared in accordance with Title 23, U.S.C., Section 104(b)(5)(A) and the FHWA Instruction Manual by the _____ Highway Department (Department of Transportation) in cooperation with the Federal Highway Administration.

_____
(Name and Title)
State Highway Department

_____
(Name and Title)
Federal Highway Administration

Figure 1: Signature Sheet

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Federal Highway Administration Report

It is expected that the Federal Highway Administration report to the Congress will contain the following material:

- o This manual
- o Narrative report of findings, including recommendations, and an approximate estimate of total cost to complete the Interstate System
- o Map of the National System of Interstate and Defense Highways
- o Table 3, Summary of Amounts not Included in Costs for Apportionment Factors (Section VI)
- o Table 4, National Summary of Estimated Costs, 1987 Estimate (Section VI)
- o Table 5, Apportionment Table
- o Summary of Total System Costs
- o The reports as submitted by the State highway departments to the FHWA with errata sheets

The Federal Highway Administration will furnish each State highway department copies of the material listed above (except the States' reports) and supplemental material as may be added thereto by the Secretary of Transportation when submitting the consolidated report to the Senate and House of Representatives of the Congress.

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II - DESIGN DETAILS OF INTERSTATE SYSTEM

In Section I the philosophy of this estimate and general information and controls are enumerated. Enactment of the 1981 highway act limits the work which may be constructed using Interstate construction funds. However, since the passage of the 1956 highway act there have been established policies and guide values by the AASHTO and the Federal Highway Administration covering general practice in design features on the Interstate System. Within the general information and controls enumerated in Section I, this section provides instructions for estimating the remaining eligible work to be included in the estimate. In this way, uniform application of policies and guides which constitute the basis for determination of the major features of design may be achieved.

Generally, these standards, policies and guides concerning location and design apply to the design of projects for the construction of sections that are gaps and incorporated sections with approved major upgrading work which constitutes the initial FAI funded construction. On other segments, originally built with FAI funds, the design standards, policies and guides apply only to the specifically eligible work (i.e., HOV lanes and associated facilities and added mixed lanes) which were included in the 1981 estimate. The 1981 highway act, in redefining Interstate completion, does not allow Interstate construction fund eligibility for general upgrading of open to traffic segments to current standards. The general rehabilitation or addition of roadway, environmental, or roadside design elements may be funded under the 4R program using funds apportioned under 23 U.S.C. 104(b)(5)(B). Accordingly, the design standards, policies and guides discussed in this section only set forth applicable criteria and do not in themselves establish eligibility of work for Interstate construction funding.

Design Basis

The estimate is to be prepared on the basis of design values selected by the State highway departments, with the concurrence of the FHWA Division Administrator, which are considered necessary elements of a balanced design representing sound engineering judgment, practical consideration of essential environmental requirements and full economic consideration. This estimate provides for a delineation of costs which closely corresponds with the delineation in the 1981 estimate between (1) construction work necessary to allow a section to be opened to a minimum level of acceptable service, (2) approved major upgrading work needed on open-to-traffic segments built without FAI funding, (3) certain approved stage construction work, and (4) additional phases of initial work, approved added lanes and approved HOV lanes and associated facilities to complete open to traffic sections. Where differences of opinion exist regarding design values to be used in this estimate or as to the proper delineation of the work items, the Regional Administrator, and if necessary the Washington Headquarters, is to be consulted for instructions to insure uniformity in application of design features and delineation of costs.

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It is intended that all sections of the Interstate System be developed to be in reasonable conformity with the approved geometric standards for the applicable design year. For the purposes of this estimate the following conditions govern the selection of the applicable design year:

Segments on New Location - For those estimate sections on new location whereon, prior to January 1, 1986, FHWA has not authorized an initial basic construction project with FAI fund participation, any work within the section shall be based on a design year not later than 20 years from the predicted date of authorization of the initial basic construction project by FHWA. For such estimate sections, the State is to establish for estimate purposes a schedule showing the predicted year in which the initial basic construction project on such sections will be authorized. The predicted year of construction is not binding upon either the State or FHWA.

Major Upgrading Work Incorporated Highways - The 1981 estimate included open-to-traffic segments incorporated into the System under 23 U.S.C. 103 which had no FAI funding for initial construction or major upgrading, and on which the need for major upgrading was determined necessary and approved in accordance with FHPM 6-3-2-4 by the Washington Headquarters. The design year for the additional work on such segments shall be established by special study of the project conditions but may not be greater than 20 years later than the predicted date of authorization of the improvement project. In establishing the design year and the minimum standards for a project, consideration should be given to the cost effectiveness of the project, to the traffic service provided on adjacent sections, and to the environmental consequence and economic feasibility of the project. In all cases, the estimate shall be based on providing a minimum of four lanes except as discussed in Section II (page II-6).

Stage Construction - For those estimate sections on segments open to traffic or on segments currently under construction whereon, prior to January 1, 1986, FHWA had authorized an initial basic Interstate construction project with portions of the ultimate design approved as later stage construction, the remaining necessary work for completion of those sections shall be based on the design year for the initial FAI project.

Additional Improvements on Segments Open to Traffic - The 1981 estimate included estimate sections on segments which were initially constructed or have had major upgrading improvements with FAI participation but which had additional eligible improvements such as HOV lanes and associated facilities, added general purpose lanes, or later phases of initial work necessary to complete the segment to a minimum acceptable level of service. Where such sections are identified as segments which have remaining work eligible under the 1981 highway act the design year for the additional work (i.e., HOV or mixed lane projects) to be funded with Interstate construction funds shall not be greater than 20 years later than the date of authorization of the initial Interstate construction project. In establishing the minimum standards for a project for additional lanes that are still justified, consideration should be given to the cost effectiveness of the project, to the traffic service provided on adjacent sections, and to the environmental consequence and economic feasibility of the project.

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The scope of the eligible construction on sections where mixed lanes and HOV lanes are being added on FAI built sections shall be limited to construction of the lanes and work necessary to reestablish existing service. The cost of other modifications or upgrading on such sections is not eligible for Interstate construction funding.

Design Features and Standards (Applicable to Initial Construction and Approved Major Upgrading Work)

The design standards of 23 U.S.C. 109(b) shall be the basis for design of the initial construction or approved initial FAI funded major upgrading work on incorporated segments. The design, as a minimum, shall provide control of access, a four-lane divided facility (exceptions noted on page I-10) and those features which are necessary to construct a facility adequate to accommodate safely and efficiently the types and volumes of traffic forecast for the applicable design year of up to 20 years (within the lane limitation provided in the 1981 act) from the predicted date of authorization of the initial basic construction project. The following subparagraphs discuss the features and applicable standards and guides for this work.

Social, Economic and Environmental Considerations

Sections 109(h) and 128, Title 23, U.S.C., require that all potential economic, social and environmental effects relating to proposed highway projects are fully considered and that the decisions are made in the best overall public interest. 23 CFR 771, ENVIRONMENTAL IMPACT AND RELATED STATEMENTS and FHPM 7-7-5 PUBLIC HEARINGS AND LOCATION/DESIGN APPROVAL provide the guidelines and procedures for determining these effects by the use of interagency coordination, community involvement and the interdisciplinary approach. The Department of Transportation Act, 49 U.S.C. 1653(f), and 23 U.S.C. 138 require special efforts to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges and historic sites. 23 CFR 771 sets forth procedures for compliance with the above laws and with 42 U.S.C. 4331(2)(c), known as Section 102 of the National Environmental Policy Act, and with 16 U.S.C. 470(f) known as the National Historic Preservation Act. Where it is necessary to disturb such areas, special attention should be given to minimizing the involvement and reducing any harmful effects. Requirements for control of soil erosion are contained in FHPM 6-7-3-1 EROSION AND SEDIMENT CONTROL ON HIGHWAY CONSTRUCTION PROJECTS. Any expected costs attributable to providing for control of erosion during and after construction should be included in the estimate.

It is recognized that consideration for the social, economic and environmental (SEE) effect has been part of highway design for many years and costs attributable to these effects have generally been included in previous cost estimates. To satisfy current environmental requirements it may be necessary to add design features which were not identified prior to the 1981 estimate. Such additional design features or changes in design concepts or locations from those shown in the 1981 estimate which are readily identified and have been specifically approved as necessary to mitigate specific impacts on the environment or prevent its degradation may be considered for inclusion in this estimate and in the preparation of plans for remaining sections to the extent

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permitted in Section I under "Major Design Revisions." Essential environmental requirements which are eligible for Interstate construction funds under the provisions of the 1981 highway act are to be included in the estimate as required as part of initial construction on gap segments or initial major upgrading on incorporated segments. Major changes being proposed as an essential environmental requirement and involving substantial cost increases over the 1981 estimate may be included in the estimate, if approved, and only to the extent provided in Section I under "Major Design Revisions" and "Essential Environmental Requirements."

Design Considerations in Urban Areas

The design of freeways in urban areas are expected to reflect a proper regard for community values consistent with the transportation needs to be served. Consideration should be given to esthetic, social and environmental values, in balance with other design requirements and restraints. Short segments of covered highways, for instance, may be justified as a necessary element of an urban highway design in order to alleviate a specific environmental impact on the land use of the area or community to be traversed. It is not considered economically prudent or feasible, however, for covered highways to be adopted as the sole or major answer in response to the public opposition to a transportation facility in an urban area. The project's design is to be based on a practical and prudent use of depressed sections, short covered sections, surface sections, or viaduct sections development in a total cost effective manner to meet the transportation needs and in consideration of the land use needs in the immediate urban area being traversed. Compatibility with other local, State and Federal programs for the area may also be considered; however, work eligible for Interstate construction funding and included in the estimate is limited to such design features and concepts which were specifically developed to meet essential environmental requirements.

In cases where multiple use of land for highways, housing, recreation, and commercial and industrial buildings could be made to the benefit of all the development of air space above and/or below Interstate freeways may be considered. State highway departments are encouraged to consider the acquisition of rights-of-way in limited vertical dimension in order to promote the joint development-multiple use concept thereby insuring proper utilization of land. In addition, the whole-block taking concept should not be overlooked in the acquisition of rights-of-way for Interstate highways in high density urban areas. The use of this concept may be the most cost-effective approach and would allow the highway department or other public agency to retain the unneeded portions of blocks through which the highway passes at less cost than would have been realized without the highway. Where plans for the total type of development are reasonably complete, costs of the portion which is eligible for Federal-aid highway participation should be included in the estimate; those costs attributable to other than highway requirements are not to be included. Federal-aid highway participation in the costs of highway rights-of-way is outlined in the FHPM 7-1-3 REIMBURSEMENT PROVISIONS.

In the case of Interstate highway viaducts or depressed freeways in urban areas, costs of improvement or provision of parallel surface level streets are not to be included in the estimate. Such streets are not necessary for control of access on the Interstate viaduct or depressed freeway, and they function primarily as a part of the local street grid which is little disturbed.

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Essential street connections that become frontage roads are exceptions and are part of the participating work to be estimated. Where a street intersection or the remainder of a block is to be modified as a part of terminals of ramps to or from viaducts, depressed freeways or tunnels, the cost may be part of the estimate. When a viaduct utilizes the right-of-way of an existing street, adjustments for viaduct column construction may be included in the estimate.

For covered sections, the cost of the added features necessary to accommodate multiple use of the section such as added height of walls, added structure components and other appurtenances including tunnel ventilation, monitoring, the protection and communication systems necessary to the operation of the highway section may be included in this estimate only if the added feature has been specifically identified and approved as an essential environmental requirement necessary to the construction of the section.

Noise Abatement

Section 109(i), Title 23, U.S.C., requires that highway noise standards be developed and promulgated. These standards have been promulgated by FHPM 7-7-3 PROCEDURES FOR ABATEMENT OF HIGHWAY TRAFFIC NOISE AND CONSTRUCTION NOISE.

The costs anticipated for noise abatement measures on gap sections and on incorporated Interstate sections with approved major upgrading are eligible for Interstate construction funding and may be included in the estimate when such measures are determined necessary in accordance with the provisions of FHPM 7-7-3. Cost for noise abatement measures on FAI built open to traffic sections and on incorporated sections (which have no approved major upgrading) shall not be included as eligible costs in this estimate (unless the measures are approved stage construction which was found necessary due to impacts identified at the time of PS&E approval of initial construction).

On sections not yet constructed the costs for installation or construction of noise barriers or other devices may be included in the estimate for those sections when it is determined that the benefits outweigh the overall adverse social, economic and environmental effects of the noise abatement measure in accordance with FHPM 7-7-3. Costs for noise barriers proposed for construction on incorporated sections which have approved major upgrading in the 1981 estimate may also be included on an individual basis where studies identifying and justifying abatement needs have been completed and the State has firm plans to provide the abatement measures as part of the major upgrading project.

Costs for noise insulation of structures, as provided in FHPM 7-7-3 may be included both for gap and incorporated sections with approved major upgrading in the 1981 estimate.

Costs may be included on both gap and incorporated sections with approved major upgrading for acquisition of undeveloped or predominately undeveloped land for Type I projects (either in fee or a lesser interest) for providing buffer zones for the purpose of noise attenuation where existing land use activities are incompatible with anticipated highway noise levels. Such right-of-way costs are to be estimated on a parcel by parcel basis as outlined in Appendix B.

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Pedestrian Facilities and Bikeways

The estimate may include on gap sections the cost of pedestrian overpasses and underpasses, including bridle and bicycle path crossings, where their construction is necessary to provide for continuity of travel that would be interrupted by construction of the Interstate project.

The costs of other bicycle, pedestrian and equestrian trails and control devices along an Interstate gap section are not eligible for inclusion in the estimate. When the trails are to be constructed in conjunction with the highway, can be safely accommodated within the Interstate right-of-way, and if they qualify under the provisions of FHPM 6-2-5-2 such work may be funded with Interstate 4R funds.

Basic Number of Traffic Lanes

The Federal-Aid Highway Act of 1966 amended 23 U.S.C. 109(b) to require that the standards for the Interstate System provide for at least four lanes of traffic on all through traffic sections of Interstate highways. (Exceptions are provided, however, under Sections 121 and 158 of the Federal-Aid Highway Act of 1973 and Section 152 of the Federal-Aid Highway Act of 1976.) Costs for such work are to be included in this estimate.

The provisions of the Federal-Aid Highway Act of 1981 in Section 4(b) limit the number of lanes eligible to be built using Interstate construction funds to not more than six lanes (exclusive of HOV lanes) in rural areas, small urban areas, and all urbanized areas under 400,000 population and up to eight lanes (exclusive of HOV lanes) in urbanized areas of 400,000 population or more as shown in the 1980 Federal census. The 1981 act further limited the design concepts eligible for Interstate construction funding to those included in the 1981 estimate. Lanes beyond the limitations of the 1981 highway act may be funded with other funds (including 4R funds apportioned under 23 U.S.C. 104(b)(5)(B)).

An addition to the number of lanes included in the 1981 estimate on gap sections will only be considered if a project was in preliminary status of design development at the time of the 1981 estimate. Such additional lanes are considered a change in design concept and must be approved in accordance with "Major Design Revisions" in Section I.

Added mixed traffic lanes that were included in the 1981 estimate on FAI built open to traffic segments are eligible for Interstate construction funding if the justification for the work is still valid. Only those which are still justified may be included in the estimate. No increase to the number of the lanes shown in the 1981 estimate may be approved for inclusion as an eligible cost in this estimate nor will new proposals for the addition of lanes on FAI built or incorporated sections be considered for inclusion as an eligible cost.

Costs of lanes in excess of the number of lanes to be built with Interstate construction funds, shall not be included in this estimate.

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High Occupancy Vehicle Lanes

The provisions of Section 4(b) of the 1981 highway act allow use of Interstate construction funds to construct high occupancy vehicle lanes including approaches and directly related facilities if such work was included in the 1981 estimate and approved. As with mixed traffic lanes, high occupancy vehicle lanes should only to be included in this estimate if they remain justified.

Interstate highway designs included in the 1981 estimate that will provide exclusive or preferential lanes for high occupancy vehicles (HOV's), including directly associated facilities, including: fringe parking, signing, highway traffic control devices, bus passenger loading areas and facilities (including shelters) are eligible for Interstate construction funding. Where the Interstate development is to be initial construction or major upgrading of the highway and includes separate exclusive or preferential high occupancy vehicle roadways as part of the Interstate project, the normal action by FHWA Division Administrators to establish that these features are proper parts of the total highway project should be followed. Upon approval of such features, their costs may be included in the estimate if the HOV work was included in the 1981 estimate.

Pavement Structures

The estimate of cost for pavement structures for the through traffic lanes, for frontage roads, for ramps, etc., is to be computed from the design based on the traffic volumes and the frequency of passage of heavy axle loads estimated to occur by the design year (for the 20-year period from date of authorization of the initial basic construction contract) and on an engineering evaluation of all governing factors. These include local climate conditions, the natural soils to be encountered in cuts and to be incorporated into the embankments, the availability and costs for aggregates and other materials for pavement structures of alternate types and for their incorporation into a completed roadway, and the expected maintenance costs as derived from experience records for the various types and combinations of surface, base, and subbase considered.

For pavement design, the percentage of trucks of various types as a percent of ADT (not DHV) and related axle weight frequencies are needed. The proportion of trucks in the traffic stream is increasing over time, and this trend is expected to continue. Also, the larger trucks now permitted on Interstate routes should be considered when determining the equivalent daily 18-kip axle loads.

In those States where the pavement structure may be constructed in stages, the estimate is to be based on the ultimate design expected to be in service as of the design year.

The design should be consistent with the AASHTO Interim Guide for Design of Pavement Structures dated 1972, Chapter III, Revised 1981, and with procedures that have been found by experience to prescribe a durable and otherwise satisfactory pavement structure under the conditions that will prevail on the individual sections of the Interstate System highways. The policies for pavement design are provided in FHPM 6-2-4-1, PAVEMENT DESIGN POLICY. The State's detailed work sheets are to contain supporting data for the designs for which estimates are prepared. It is not expected that conditions will lead to a homogeneous base and surfacing design.

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In the pavement design used as the basis for this estimate, special attention should also be given to the skid resistance characteristics of the wearing surface as set out in FHPM 6-2-4-1 and T5040.17 and GUIDELINES FOR SKID RESISTANT PAVEMENT DESIGN, AASHTO 1976. Skid resistant overlays are only eligible for funding with Interstate 4R funds and the costs for such work shall not be included in this estimate even if the work was identified as stage construction in the 1981 estimate.

Width of Traffic Lanes

For the purpose of this estimate all general purpose traffic lanes should be estimated on the basis of a 12-foot width.

Shoulders

The Geometric Design Standards for the National System of Interstate and Defense Highways provide that "Shoulders usable by all classes of vehicles in all weather shall be provided on the right of traffic." On medians of sufficient width there are both structural and operational advantage in all-weather left shoulders within the median. The following shoulder widths are considered appropriate on Interstate highways and may be used in the preparation of the estimate. The work necessary to provide shoulders to the widths shown on gap sections, incorporated sections with approved major upgrading and if identified as approved stage construction may be included as eligible cost in the estimate.

Right Shoulders

(a) For all highways, a 10-foot usable width is to be provided, except that in mountainous areas 6 feet may be used. The entire usable width may be surfaced or paved.

(b) Where the number of trucks per hour in one direction in the design year is forecast to exceed 250, a usable width of 12 feet may be provided, all of which may be surfaced or paved.

Left Shoulders

(a) For four- and six-lane divided highways, up to 6 feet of usable width may be provided of which up to 4 feet may be surfaced or paved, where such widths are practicable. Recognizing a need for refuge on both the left and right for vehicles in distress on three-lane or more directional pavements, full 10-foot shoulders should be provided on the left, all of which may be surfaced or paved.

(b) For divided highways with narrow medians having median barrier protection, it is in many cases difficult, costly and hazardous to maintain narrow grassed strips between minimum width paved left shoulders and the median barrier. In such situations, where the State highway department and FHWA Division Administrator agree, it is satisfactory to surface or pave the entire median area.

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The width of usable shoulder for purposes of this estimate, is the width of shoulder area outside the edge of travel lane which is structurally stabilized for all-weather usage. The graded section may include a reasonable width beyond the stabilized shoulder width, as may be necessary for proper engineering design, for reasons such as safe recovery area, support of the shoulder, or installation of guardrail, or in special conditions to provide storage for snow.

Bridges

The costs of bridges is to be estimated on the basis of the AASHTO Interstate Standards as revised June 20, 1967, referenced in FHPM 6-2-1-1, DESIGN STANDARDS FOR HIGHWAYS.

All new structures are to be estimated on the basis of a 16-foot minimum vertical clearance on existing structures except as provided in the AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES dated 1977, as amended and the AASHTO POLICY ON DESIGN STANDARDS FOR THE INTERSTATE SYSTEM dated June 20, 1967. Costs to provide a 16-foot vertical clearance may only be included in the estimate as eligible work if the structure is located on an incorporated section with approved major upgrading included in the 1981 estimate.

Movable bridges may be estimated as part of the Interstate System only if such type of bridge is permitted under conditions set forth in FHPM 6-7-1-1 (PPM 50-4.1) HIGHWAY-WATER RESOURCES DEVELOPMENT (BRIDGE CLEARANCE FOR NAVIGATION).

Grade Separations

The provisions of the 1981 highway act in Section 4(b) requires full access control confirming a longstanding access control policy on the Interstate System. The decision to develop the Interstate System network with control of access throughout its length is the warrant for providing highway grade separations. The decision to provide control of access is based primarily on the fact that the separation of grades provides the greatest increment of safety to the highway users.

The Interstate highways are being constructed nationwide and thus cross many other highways, roads, and streets that are in place and in use. Each existing road intersected or each additional road for which there is a firm plan or commitment for construction poses a problem of proper treatment; that is, whether it is possible to terminate or close the existing road at the Interstate System right-of-way, whether it is necessary to carry the crossroad over or under the Interstate highway, with or without connecting ramps, or by use of frontage roads reestablish the continuity of the existing street pattern.

Each State highway department is to evaluate each crossing or intersecting road, and on the basis of the engineering, economic, and other important public benefit considerations, determine, in cooperation with the FHWA Division Administrator, the separation structures, the number of lanes, and the extent of work on the crossroad to be included in the estimate.

Grade separations incidental to projects eligible for Interstate construction funding and approved for the 1981 estimate do not require further documentation for inclusion in this estimate, provided the control conditions

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for which they were approved still apply. Additional grade separations approved as eligible for FAI funding subsequent to the 1981 estimate may be included on gap sections and on incorporated sections with approved major upgrading if they were in a preliminary status of design development at the time of the 1981 estimate and there has been approval of a change in design concept or location (as discussed under "Major Design Revisions" in Section I) which now necessitates carrying the crossroad over or under the Interstate highway.

Costs for protective screening along structure railing may be included where such work is appropriate (on structures being built or upgraded on eligible projects) under the warrants provided in the AASHTO Guide, A GUIDE FOR THE PROTECTIVE SCREENING OF OVERPASS STRUCTURES dated 1969.

Intersecting and Other Local Roads

Crossroads, or local roads which are adjusted or relocated, are to be constructed to standards for the system of which the crossroad is a part. In addition to any necessary structure, the adjustment of a crossroad, including the grading, drainage, surfacing, etc., is eligible to the extent required as part of an eligible Interstate improvement. The limits of the section to be included will be the points at which the new grade line reaches the normal ground line or the extremities of ramp terminal or pavement flares at interchanges.

Improvement of the crossroad to a greater number of through lanes, is to be included in the estimate only where it is a portion of a proposed improvement of substantial length on the crossroad which is to be accomplished in conjunction with the Interstate project or where added lanes on the crossroad are required for proper operation of the interchange.

When the Interstate highway improvement disrupts a local road and makes necessary the local road relocation, the construction of the relocated road may be included in this estimate if the cost of such relocation is less than the cost of otherwise maintaining or restoring local circulation, such as the construction of a grade separation.

Frontage Roads and Other Land Service Facilities

The estimate is to include the cost of land service facilities which are an essential part of the design of the Interstate highway section as discussed below or when found to be in the public interest as described in FHPM 7-2-2-2 LAND SERVICE FACILITIES.

Land service facilities such as private roads, frontage roads, bicycle paths, sidewalks, and pedestrian separations, and combination drainage and vehicular or stock passes may be incorporated into the Interstate highway design in order to reduce the disruptive effect the highway may have on a particular community, or recreational activities and wildlife or on the operation of a farm, ranch or other business which the Interstate highway location severs.

The need for frontage roads, as an essential part of the design of the Interstate highway section, will be determined in most instances by the decision to develop the highway on existing or new location. Where the decision is made to construct the controlled access highway on an existing location where direct

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access from abutting property was available, it may be necessary to provide frontage roads as a means of obtaining control of access. Where an Interstate highway is developed on new location no inherent right of access belongs to the adjoining property owner and frontage roads, therefore, need not be provided for the sole purpose of controlling access. On new location, frontage roads should be provided only where economically justified or otherwise found to be in the public interest for one of the purposes discussed in FHPM 7-2-2-2. Costs for frontage roads included in the estimate are to be estimated on the basis of a design meeting the current standards of the local road system of which they are a part in order to reasonably accommodate local traffic needs.

The construction of land service facilities which are designed for public use, or to provide access for multiple landowners shall be justified as a part of the normal design development process as discussed in FHPM 7-2-2-2, paragraph 4b. Land service facilities designed for restoration of access to and within a privately owned property shall be justified primarily on the basis of economics as discussed in FHPM 7-2-2-2, paragraph 4c.

Interchange Spacing

It is important that interchanges be so located to properly discharge and receive traffic from other Interstate and Federal-aid system routes, or major arterial highways or streets. It is equally important that they not be spaced so closely as either to unnecessarily increase the cost of the System or interfere with the free flow and safety of traffic on the Interstate System.

Interchanges within urban areas should not be spaced closer than an average of 2 miles, in the suburban sections as average of not closer than 4 miles, and in rural sections as average of not closer than 8 miles. Obviously, however, in consideration of the varying nature of the highway, street or road systems with which the Interstate System must connect, the spacings between individual adjacent interchanges must vary considerably. In urban areas, the minimum distance between adjacent interchanges should not be less than 1 mile, and in rural areas not less than 3 miles.

The cost of interchanges eligible under the 1981 act which were found justified and approved for inclusion in the 1981 estimate, may be included in this estimate without additional documentation provided the control conditions for which they were approved still apply. Where a State recommends an additional ramp or interchange on gap sections or on incorporated segments which were approved for major upgrading at the time of the 1981 estimate, the additional interchange or ramp may be included in the estimate only on projects that were in preliminary status of design development at the time of the 1981 estimate and there has been approval of a change in design concept or location (discussed under "Major Design Revisions" in Section I) which necessitates the additional ramp or interchange.

State documentation for justification of an additional interchange normally will include the following information in addition to other data demonstrating public benefits or need:

(1) A statement of the type and condition of the crossroad including:

a. The system or regional plan of which it is a part.

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b. ADT, current and design year; through and turning.

c. Number of existing traffic lanes and type of highway.

d. Probable number of traffic lanes for the design year.

e. Distance to and size of communities directly served.

f. Distance to the next interchange in each direction.

(2) An analysis of the crossroad and, the other roads and streets in the area, and the relation of the interchange to them and to other interchanges to assure the ability of the streets and roads to effectively collect and distribute Interstate highway traffic.

(3) The relationship of the interchange to adjacent interchanges of the Interstate highway and the acceptable merge and diverge lengths, and the ability to sign adequately.

(4) The existence of other roads or streets, or the probability of developing them, generally parallel to the Interstate System, which could be used by Interstate highway traffic by way of interchanges other than the one under consideration in traveling to and from its origin or destination.

(5) A statement of the cost resulting from construction of the interchange, together with the estimated benefit-cost ratio, as part of a cost effectiveness analysis.

(6) A special case where the interchange is clearly necessary to satisfy a compelling public need such as to provide access to HOV lanes or access to fringe parking areas.

The costs of approved added ramps or interchanges on open to traffic sections (except those approved either as necessary to approved major upgrading of an incorporated section, as incidental work to approved HOV lane facility or as an approved stage of initial construction and included in the 1981 estimate) shall not be included in the estimate.

Lighting

Lighting of the Interstate System should be based on the AASHTO 1984 edition of AN INFORMATIONAL GUIDE FOR ROADWAY LIGHTING.

Costs for lighting of Interstate highways exclusive of frontage roads should be included in the estimate, provided the conditions on the sections where lighting is to be installed warrant such installation if part of initial construction, approved stage construction or approved major upgrading of an incorporated section. Modification of existing lighting systems is no longer eligible for FAI construction funding and the costs for such work shall not be included in the estimate.

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On sections that include eligible lighting systems, the estimate should include the cost of impact attenuation features for lighting poles where these features are deemed necessary for roadside safety. The most current AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS, describes the requirements for breakaway features. These requirements should be met on all new installations.

Traffic Control Devices

The operation of the Interstate System requires adequate signs and pavement markings in accordance with standards that are uniformly applied across the country. The 1978 edition of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), as amended, enumerates the standards to be used. Costs of signing the Interstate Highway System in accordance with the MUTCD are to be included in this estimate. Surveillance and control systems, identified as necessary under FHPM 6-8-3-4 TRAFFIC SURVEILLANCE AND CONTROL, may be included in the estimate only when such systems are needed in connection with a tunnel, covered highway section, or associated with HOV lanes which are eligible for Interstate construction funding.

Eligible costs for higher cost materials such as Type III sheeting, raised pavement markers, thermoplastic, or preformed materials, as discussed in FHPM 6-8-3-1 TRAFFIC CONTROL DEVICES ON FEDERAL-AID AND OTHER STREETS AND HIGHWAYS, may be included in the estimate on all new Interstate projects. Raised pavement markers are recommended as a supplement to, or in lieu of, painted lines, preformed materials, and thermoplastic lines. Normally, in rural areas, raised pavement markers are used only to supplement painted lines.

In harmony with the controlled access principle, U-turn median openings for used by the general public shall not be provided on the Interstate. Where such openings are needed, U-turns of an appropriate design may be provided in limited numbers and signed for use by highway police cars, emergency service vehicles (tow trucks, ambulances, or fire-fighting apparatus), and equipment engaged in physical maintenance and traffic services on the highway. Costs of median openings, located and designed in accordance with the AASHTO POLICY ON U-TURN MEDIAN OPENINGS ON FREEWAYS, 1960, with appropriate consideration to roadside safety, may be included in this estimate.

Fencing

Access to Interstate highways is to be controlled throughout, and the costs for fencing of the appropriate type and location as necessary to prevent encroachment, is to be estimated on sections to be built and if appropriate as the final phase to complete initial construction on open to traffic sections. The cost of fencing along gap sections or where needed on existing Interstate highways is to be included in this estimate in conformity with the AASHTO 1967 INFORMATION GUIDE ON FENCING CONTROLLED ACCESS HIGHWAYS.

Safety Features on Initial Construction

The Federal Highway Administration concurs fully in the recommendations presented in the AASHTO 1974 Traffic Safety Committee Special Report -- HIGHWAY DESIGN AND OPERATIONAL PRACTICES RELATED TO HIGHWAY SAFETY. It is expected that each State will give full consideration on all projects for initial basic

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construction, approved stage construction or initial major upgrading of an incorporated section to the design and construction of a roadway cross section as safe and clear of roadside obstructions as feasible. Where approved added mixed traffic lanes or HOV lanes and associated facilities are eligible, the feasible safety improvements incidental to the eligible work may be included in the estimate.

Stage Construction

The costs for portions of the ultimate design which were identified and approved at the time of initial project authorization as planned later stage construction and included in the 1981 estimate should be included in this estimate where there is a serious intent to accomplish the work within the life of the program.

In States where sections of Interstate highways were originally planned, designed and constructed with FAI funds as two-lane, two-way highways the estimate is to include completion of the initial basic construction in accordance with 23 U.S.C. 109(b) in order to provide a minimum of four lanes of traffic on all through traffic sections.

For those sections on which paving work was authorized with stage construction to provide the ultimate design indicated on the approved plans in accordance with FHPM 6-2-4-1 PAVEMENT DESIGN POLICY the costs may be included in the estimate (except skid resistant overlay projects may not be included). Conversely, costs for additional surfacing on projects constructed initially or having had upgrading with FAI funds are not to be included, regardless of date of construction authorization, if the approved plans did not indicate further stage construction.

The costs of any constructing of lanes, ramps, or interchanges which have been identified as approved stage construction and are still justified improvement, needed for completion of ultimate design should be included in the estimate.

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III - ROUTE DESIGNATION AND DESCRIPTION

State Map

In order to uniformly identify the general route location and Interstate route numbers, each State except those with no remaining costs, shall prepare and submit an outline map as illustrated in Figure 2, page III-3 on the following basis:

1. Show State in outline to convenient scale on a sheet 11 by 14 to 20 inches. All lines, lettering, etc., is to be of a type and size which is clearly legible.

2. Show each established control area within the State as a circle and each State line control area as a smaller circle. Where applicable, show the urban area or city name.

3. Show the general location of each route between control areas and indicate its Interstate route number. The route numbers are to be those adopted by the AASHTO and shown on official map as revised.

4. Identify each route or route segment added to the system under 23 U.S.C. 139(a) (nonchargeable mileage) with this symbol (XXXX).

5. Identify the routes and route segments that have been identified as being of National Significance (N) by a solid line. Routes and route segments of Local Significance (L) are to be shown as a dashed line.

6. Outside of the State outline show the general direction, by an arrow and number, of a portion of the continuing route in the adjoining State and name of the next control area.

7. Where there are Interstate route spurs, loops, or belts in the near urban areas, show the urban area or city name and the routes and their numbers. Where necessary include on the State map sheet, or on an additional sheet, separate enlarged urban area inserts on which all routes and numbers can be shown clearly similar to Figure 2.

Tabulation of Route Description

Prepare a tabulation of the approved route descriptions as shown in Table A, page III-4. For each route insert the description as per the Federal Highway Administration approval letter covering the entire length between terminal points. It is expected that all route descriptions will have been approved. A route or portion thereof for which a description has not yet been approved is to be indicated by footnote.

The route length, the total of segments identified as being of National Significance (N) and segments identified as being of Local Significance (L), should be consistent with the miles reported in the PR-511 summary as of

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December 31, 1985. If during preparation of the estimate it is determined that the PR-511 mileage is incorrect, the correct mileage should be included in the estimate and the necessary revisions made on the PR-511.

The route mileages listed on Table A should include the segments approved under 23 U.S.C. 139(a) as well as those segments being charged to the 23 U.S.C. 103(e)(2) reserve. However, immediately under the total route mileage, the 23 U.S.C. 139(a) and 103(e)(2) mileage, should be indicated in parenthesis.

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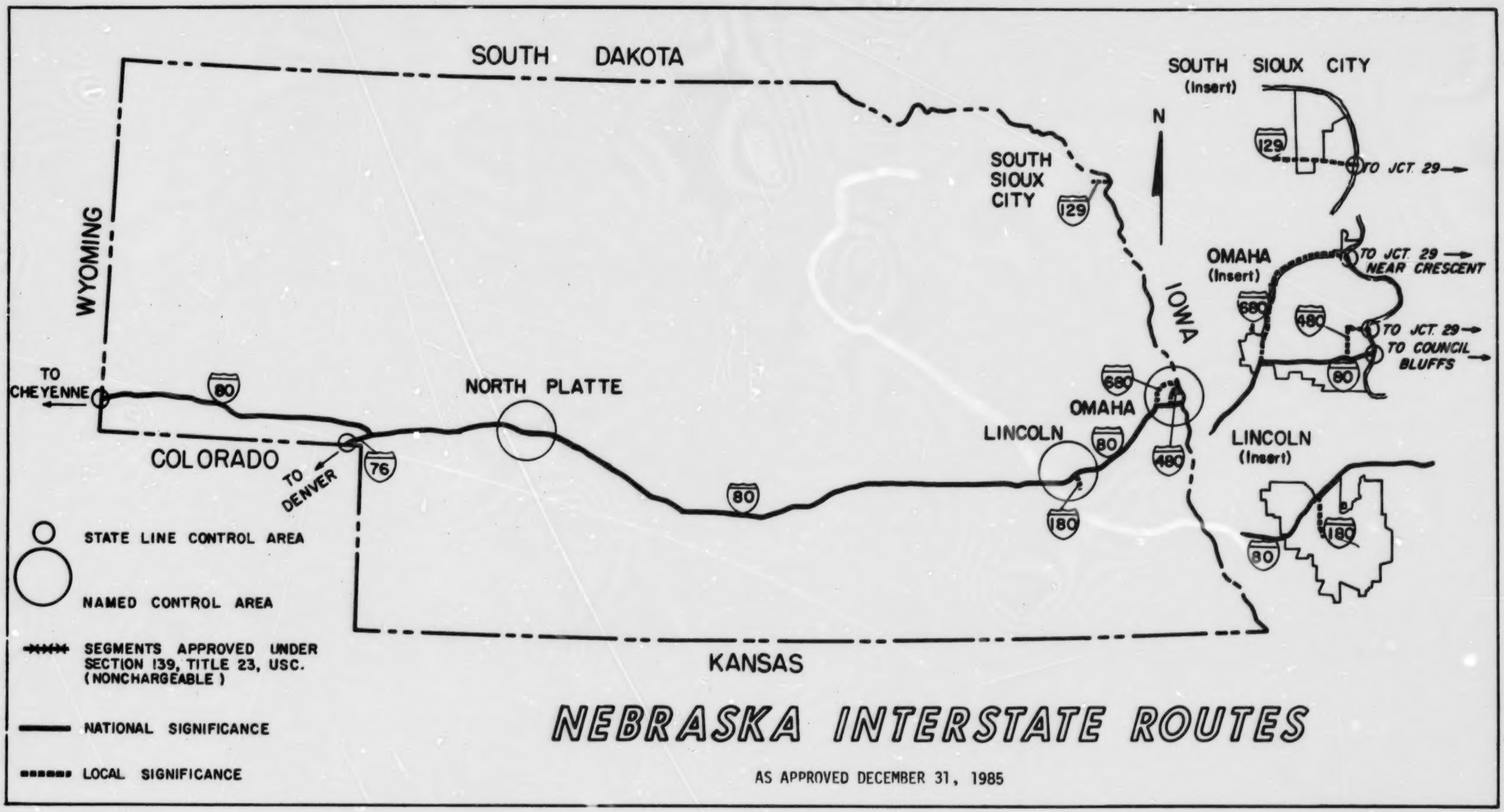

NEBRASKA INTERSTATE ROUTES

AS APPROVED DECEMBER 31, 1985

Figure 2

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TABLE A

APPROVED INTERSTATE ROUTE DESCRIPTION

STATE _____

ROUTE NUMBER	ROUTE DESCRIPTION	Length Miles	
		ROUTE SIGNIFICANCE N	ROUTE SIGNIFICANCE L
	(To be on 11 x 14 to 20 inch sheets in report)		
TOTAL			

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IV - ESTIMATE SECTIONS AND DESIGN DATA

Establishment of Estimate Section Breakpoints

Segments With No Eligible Work (Zero Cost)

For segments of the Interstate System where it is determined there is no remaining work eligible for Interstate construction funding under the 1981 highway act, no reporting of data on Table B is necessary.

For entire routes with no costs, it is not necessary to prepare a Table B for that route.

If however the State elects to report on all segments, the 1983 estimate reporting procedures may be used. Adjacent estimate sections may be consolidated into long sections showing zero cost (finance code 10 or 20) and other appropriate data in the top half of Table B. Data for these sections which determines whether sections are homogeneous and may be consolidated include finance code (10 or 20), urban or rural class, mileage increment, route significance, ultimate number of lanes (in line 10), and major status of development. All of the lines in the top half of Table B must be completed so the edit program will accept the sections. Weighted averages, highest volumes or other data most appropriate on the segment should be shown for design speed traffic and typical section reference lines in the top half of Table B. If these zero cost estimate sections are to be reported on Table B as in past estimates, information must be included in the data processing submittal (as explained in Appendix A).

Segments with Eligible Costs Reported

For segments where work eligible for Interstate construction funding is being reported, it is desirable to establish reasonably homogeneous sections that are different from adjoining sections. It is also desirable to establish sections which approximate the contract units the State proposes to use when preparing the PS&E at a later date. Estimate section breaks should therefore be provided to identify proposed contract or project limits and to meet the criteria discussed below in points 1 through 9.

Section breakpoints are to be identified by milepost as described on page IV-9. Breakpoints need not correspond with points used in previous estimates but should generally be established only as required by current conditions. It may be desirable, however, for cross reference purposes, to retain the basic sectioning from previous estimates and to only shift, delete and add points as required by present criteria.

Establishment of each estimate section requires joint consideration of design classification and the general conditions along the route. To the extent practicable, section end points used shall be established at the following general points along the Interstate route, and only at as few points as necessary to prepare the estimate of remaining eligible work:

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1. The costs for the rural and urban portions of the Interstate System are to be shown separately. Urban area boundaries, which have been established for urban places of 5,000 population and over, are to be used as section breakpoints. All sections within an urban area are to be classed as "urban." All other sections are to be classed as "rural."

   If a Federal-aid urban area boundary is revised after December 31, 1985, but before the estimate is prepared it will be acceptable to use the new limits in Table B, but the differences which required revision to the PR-511 for December 31, 1985, should be made during estimate preparation.

2. Section breakpoints are to be established where there is a change in the number of through traffic lanes, or lanes to be constructed. However, in urban areas such changes in the number of through lanes can be disregarded where resultant sections would be less than about 1 mile in length.

3. Section breakpoints are to be established where there is a change in the basic typical section, as would occur where passing into another general type of topography. Usually, this will indicate a different design speed and some adjustment in the character of the highway design. The use of variable median does not change the basic typical section.

4. Each tunnel longer than about 500 feet, and each bridge longer than about 1,000 feet are to be shown as a separate section. Any such structures that are within interchanges are not be shown as separate sections.

5. Since the total cost within each State is to be determined, where a bridge or a tunnel crosses a State line, the portion in each State shall be in a separate section. Care should be taken to coordinate this work with the adjoining State.

6. Toll facilities -- highway, tunnel, bridge, or combinations -- including those financed or under construction, are to be shown as separate sections.

7. A section break is to be provided at each change in route significance (N or L).

8. A section break is to be provided at all intersections between two Interstate routes. Use the intersection of the route center lines to establish route and section lengths. For cost reporting purposes, an entire interchange can be reported on one section.

9. A section break is to be provided at each change in major status group (1, 2, 3, 4, 5, and 6) as identified on Figure 3. Forms PR-511 updated as of December 31, 1985, should be used as the basis for determining these breaks and for reporting the status of development on Table B.

The computer printout of each PR-511 segment with its status code as of December 31, 1985, prepared in the Washington Headquarters and sent to division offices should be used for reference. During preparation of the estimate if it is noted that PR-511 status code was reported incorrectly on the December 31, 1985, the correct or more appropriate code should be reported on Table B, and revised PR-511s should be submitted.

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Design Classification - Table B, Top Half (Page IV-12)

Each State shall submit design data for each section of a route that contains eligible costs in a tabulated form on Table B. It is to be understood that the design data is shown to indicate the approximate design for which the estimate is made and does not commit either the State or the Federal Highway Administration to this design for actual construction.

As noted in Section I, traffic data (ADT) is to be reported for the base year (1984 data) and for the design year. In addition, other design data is to be reported for the applicable design year for the section. Items 8a, b, c, d, e, and f on the top half of Table B provide for the above design year information.

Where a section in Table B includes segments with traffic volume differences, the traffic data entries on Table B should be the traffic figures on the segment having the highest DHV since this traffic will govern in determining design elements such as the number of lanes.

Table B is to be submitted only for the System mileage with remaining eligible costs. The State name and code and the route number are to be shown on each Table B sheet. Data are to be reported separately for each section using the milepost section identification established as described on page IV-9.

For each estimate section with remaining eligible costs show the following items in the top half of Table B.

Item 1. Finance Code

Code No.	Definition
10. (Toll, zero cost)*	A toll road, toll bridge, or toll tunnel in service or for which all work necessary for completion was in authorized status as of December 31, 1985. Cost estimate to be zero for all items of work. Report miles on Tables B (optional).*
20. (Free, zero cost)*	A public highway which, as of December 31, 1983, was in service or not yet in service but all work necessary for completion to a minimum level of acceptable service under the 1981 act was in authorized status. Cost estimate to be zero for all items of work. Report miles on Tables B (optional).* This code is being maintained only for those States electing to report zero cost data.

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21. (Approved Stage Construction)	A public highway which is either in service or under construction and for which additional essential stage construction identified and approved at the time of initial construction is planned after December 31, 1985, with Federal-aid Interstate construction funds plus State-matching funds. Report miles and costs on Tables B.
22. (New Location, Gap Closing and Additional Phases of Initial Construction)	A public highway on new location for which work needed to permit the section to be opened to a minimum level of acceptable service or additional phases of work, (i.e., fencing, lighting, etc.) necessary to bring the section to a minimum level of acceptable service is to be undertaken after December 31, 1985, with Federal-aid Interstate construction funds plus State-matching funds. Report miles and costs on Table B.
23. (Major Upgrading on Incorporated Sections)	An existing public highway which was incorporated into the System under 23 U.S.C. 103 but has had no major upgrading with Interstate construction funds. Costs of improvements approved as necessary to complete the major upgrading sufficient to permit the improved facility to be opened to a minimal level of acceptable service and to be undertaken after December 31, 1985, with Federal-aid Interstate plus State-matching funds. Report miles and costs on Tables B.
25. (Added lanes on FAI built open sections)	A public highway which is FAI built and is open to traffic. Costs for added mixed lanes and HOV lanes and associated facilities to the extent that the work is approved and was included in the 1981 estimate and is to be undertaken after December 31, 1985, with Federal-aid Interstate construction funds plus State matching funds. Report miles (if not a dual section) and costs on Tables B.

There will be sections wherein some work is to be financed under one code classification and other work is to be financed under other code classifications. Paving approved as stage construction (finance code 21) could be in the same estimate section as approved added lanes or HOV lanes (Finance Code 25). In such cases, there shall be two or more columns for the same section, each column of which is to be headed by the finance code

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number applicable to the estimated cost for work as entered thereunder. This segregation is necessary in order that the costs for work identified as eligible for Interstate construction funds can be identified as the costs of approved essential stage construction, initial major upgrading work or added lanes. In cases where dual column entries are required, the miles for the entire section should be reported only once under the free (nontoll) finance codes (21, 22, 23, or 25) which includes the major eligible work on the section. Where the section involved is currently operating as a toll facility, the miles for that section shall be reported under the free finance code but with status group 6 (Toll). Route totals on Table B should include only mileage and remaining eligible work for the route (unless the State elects to continue reporting mileage of zero costs).

There may be some sections established in the 1987 estimate wherein only a portion of the length of the section was completed or in authorized status as of December 31, 1985. Section breaks are required to report both separately, each with its respective "code" and, in the case of the uncompleted or unauthorized portion, an estimate of cost. Existing section breaks should be adjusted or sections provided as discussed on page V-1, 2.

Item 2. Report total length of section to nearest 1/100 mile.

Item 3. Indicate class by "R" or identify by name and code the Federal-aid urban area through which each estimate section passes. The name of the urban area may be noted on only the first and last sections of a series falling within the same urban area with the intermediate sections carrying only the urban area code. The name of the urban area may also be footnoted. A list of the urban areas with their respective codes will be included in the Data Processing Instructions, Appendix A. If a required urban area and code has been omitted from the list, a code number should be requested from the FHWA Washington Headquarters (HNG-13, FTS: 426-0404).

Item 4. Identify mileage increment with the following codes:

Code 1 - All mileage authorized as part of the 42,500-mile System.

Code 2 - Routes or route segments chargeable to the mileage reserve authorized under 23 U.S.C. 103(e)(2), (commonly referred to as the Howard-Cramer Amendment).

Code 3 - If the State elects to show zero cost sections or all routes, this code is provided for route or route segments added to the System under 23 U.S.C. 139(a), (nonchargeable mileage).

Item 5. Identify mileage as to route significance with following codes. Route significance is as defined in the 1976 Interstate Gap Study and should be the same as reported in the 1985 estimate as amended by the errata.

Code N - All mileage that has been identified to be of national significance.

Code L - All mileage that has been identified to be of local significance.

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Item 6. Design Speed (V) in multiples of 5 or 10 miles per hour.

Item 7. Two-way average daily traffic for the year 1984, including existing and attracted (diverted) traffic estimated to use the section assuming that the entire Interstate System and important connecting roads and streets have been constructed and that parallel arterial roads and other streets in the traffic corridor of the Interstate highway will have been further developed.

Item 8a. Indicate the actual design year for which the traffic estimate is made, and enter traffic data for this year in Items 8b, 8c, 8d, 8e, and 8f which follow.

Item 8b. Two-way average daily traffic for the design year and including traffic due to the change in the pattern and rate of growth of land development along the Interstate highway, and in adjacent areas which will be influenced by it. The resulting total is the ADT for the design year and is entered in this item (8b). There will be some sections on which the desired traffic in the corridor assigned to the Interstate facility will exceed the capacity for the maximum number of lanes to be constructed on the section. When this situation occurs, the volume entered in Item 8b is to be the desired traffic assigned to the facility up to the capacity for the number of lanes on the section.

Where desired traffic exceeds 2,000 equivalent passenger cars per hour per lane, the DHV in terms of equivalent passenger cars to be used as a basis for Item 8c will be 2000 x N/D and ADT design year traffic for Item 8b will be 2000 x N/D x K. In these equations "N" is the number of lanes in one direction to be used as a basis for the cost estimate, "D" is the directional factor, and "K" is the 30th hour factor. The traffic volumes calculated from these equations should be adjusted downward as necessary for trucks and terrain. Where the desired traffic exceeds the capacity of the lanes to be constructed it is not necessary to adjust or determine more precise values of "K" and "D."

Item 8c. Two-way design hourly volume (DHV) as estimated for the design year.

Item 8d. The percent of vehicles (D) traveling in the direction of predominant traffic flow during DHV (design year).

Item 8e. The percentage of trucks (T) in the traffic stream during DHV (design year). Pick-ups, panels and other two axle - four tire vehicles are not considered to be trucks for geometric design purpose. Transit buses are considered trucks.

Item 8f. The percentage of trucks (T) in the traffic stream as a percent of the design year average daily traffic (ADT).

Item 9. Number of through lanes to be constructed upon which the cost estimate is based. In this item, report the number of new, complete through lanes to be built where no lanes now exist as well as the number of new additional lanes to be built on sections now having two or more lanes in existence. The number of lanes to be constructed should be

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reported under the same finance code as the associated construction costs to assure proper identification. Existing lanes to be improved, either by stage construction or reconstruction should not be included in this item.

Item 10. Ultimate number of through traffic lanes on the completed facility including lanes in place on which no funds were expended as well as lanes to be built with other than FAI funds, i.e., total number of through lanes at the end of the program.

Item 11. Indicate reference to typical cross section shown in the State's report that is generally representative for that section of the route.

Item 12. Show prevailing right-of-way width on which the estimate is based.

Item 13. Show the prevailing median width on which the estimate is based.

Item 14. Status of improvement code from PR-511 as of December 31, 1985, as identified on Figure 3. Where two or more subgroups are included in an estimate section, the subgroup having the greatest length within that section would be reported. Refer also to the dicussion on page IV-2, point number 9.

Summary totals of mileage for Item 2 are to be shown on the last sheet for each route in the right-hand column for rural and urban combined. Sheet totals are not required.

Where dual finance code entries are reported under the major eligible work on Table B, Item 2 should be reported as described on page IV-5. Item 9 should reflect work actually being proposed under the appropriate finance codes, and Item 10 should be identical under both codes.

Typical Cross Sections

Each State shall submit typical geometric cross sections which are to be identified in the top half of Table B, Item 11, by a key or number reference. Cross sections need only be included for sections with remaining eligible costs. Typical geometric cross sections should be of the type generally included in PS&E showing dimensions for the principal cross section components and right-of-way of the normal section. Sections varying only in the number of through traffic lanes need not be shown separately. Include at least one cross section showing dimensions used for estimate of Interstate System bridges and overpasses, both long and short, and underpasses. Include typical cross sections showing dimensions for each tunnel.

It is not intended that cross sections be shown for variations in section design which do not materially affect the estimate of cost.

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Strip Map

Each State shall submit a strip map for all Interstate route segments on which eligible costs are reported showing data by means of the key symbols similar to those shown on the sample Figure 4, page IV-14. Strip maps need not be included if no eligible cost is reported for an entire route. Strip maps are not needed for route segments that have no remaining eligible costs. It is emphasized again that great care should be exercised to make certain that these maps are clear and readable as they are used extensively in various Washington Headquarters offices and both houses of Congress. The maps shall be prepared on the following basis:

1. For report base maps use planning survey, county maps or equivalent topographical sheets showing all roads, assembled to form strip sheets 11 inches wide and 4 to 6 feet long on which the Interstate route approximately centers (successive sheets numbered in sequence). All markings to be clear, in black and of a type and size to permit reproduction. Individual map sheets 11 x 14 to 20 inches will be acceptable in lieu of folded sheets.

   a. County lines and the names of the abutting counties shall be clearly shown.

   b. The name of each city, regardless of size, should be clearly indicated on the strip map.

   c. Make certain that the intersecting Interstate, U.S., and State route numbers are shown.

   Show north points on each sheet. For uniformity in the State's report to be submitted to Congress, the report strip maps are to be on a scale of 1" = 1 mile. Where it is desired, the strip map or a portion of it may be shown to a larger scale as a supplement.

2. Plot as accurately as possible the location of the designated Interstate route for which the work and the cost estimates are prepared. Plot locations that are in status 5a(3) & 5a(2) as a dashed line. Plot locations that are in all other status as a solid line. Plot routes or segments added to the System under 23 U.S.C. 139(a) as an open band. The width of the plotted lines are to be 1/10-inch for both dashed and solid lines and 1/4-inch for the open bands.

3. Show clearly all urban area and city boundaries within a width of about 1 mile on each side on the Interstate location for all cities around or through which the Interstate passes. Care should be exercised that the city name or a portion of the name, or other pertinent features are not blocked out on these strip maps.

4. In a clear manner show milepost numbers approximately 3/8-inch high to designate estimate sections. Estimate section mileposts are to be in ascending order from west to east on even numbered routes and from south to north on odd numbered routes, and should be consistent with the milepost shown in the PR-511, Status of Development reports.

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As a minimum, section breaks necessitated by the nine requirements on page IV should be provided; however, a State may establish more breaks if it so chooses.

The mileposts and section lengths are to be recorded in hundredths of a mile. If this imposes a problem, the hundredth position can be zero. However, most States will find that reporting to the hundredth position will allow them to correlate this mileage with other documents.

5. In the manner illustrated on sample Figure 4, on page IV-14 for all rural sections show the following by standard key symbols (avoid color differentiation) at approximate correct position on the route location.

   a. Each railroad grade separation (bottom half Table B, Line 6)

   b. Each highway grade separation without ramps (bottom half Table B, Line 7)

   c. Each interchange (bottom half Table B, Line 8)

   d. Each bridge over 20-foot span other than the above (bottom half Table B, Line 9)

   e. Each tunnel (bottom half Table B, Line 9)

   f. Each toll bridge, toll tunnel, toll highway or combination

   g. Each frontage road on or immediately adjacent to the Interstate right-of-way and connections to through traffic lanes

   h. Each intersecting road that is terminated is to be shown with a dot as on Figure 4, page IV-14

   i. Each intersection at grade, either public road or private roadway

   j. Each safety rest area along one or both sides of the travel way

6. Within the urban area boundaries show on the strip map only the above symbols for interchanges, tunnels, toll facilities, and those bridges that are longer than 1,000 feet. It is expected that work maps in greater detail and to larger scale will be necessary on all urban sections and on nearly all rural sections in order to make the cost estimates to the desired accuracy (see Section V). Such work maps are not to be included in the strip map submission, but are to be retained in the State records for review as needed.

   Accordingly, where a State chooses not to submit a complete set of strip maps, a complete review should be made by the division and State of all current PR-511 forms to determine completeness and accuracy of project data. Any necessary updating of the PR-511 forms should be completed, and corrected sheets submitted, as soon as possible after receipt of the project listing. Timely and accurate reporting of projects on the PR-511 on a continuing basis will be particularly essential in such States since the PR-511 will become the only source for project location data.

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7. The strip map submission for this estimate will be minimal; a strip map showing the route or route segments with remaining costs. Therefore, it will be unnecessary, unless the State elects to continue past practices, to show authorized Federal-aid Interstate projects on the strip map.

8. The strip map sheets are to be assembled in order in sets for each Interstate route, which should be identified on each sheet. On each sheet (if it is larger than 11 x 14 to 20) in each set include a key of the standard symbols used. States that use the 11 x 14 to 20 strip maps need to include the key of standard symbols on the first sheet only of each route.

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ROUTE: _____

SHEET _____ OF _____ SHEETS

TABLE B

DESIGN CLASSIFICATION AND COST ESTIMATE BY ESTIMATE SECTIONS WITH ROUTE TOTALS

3/

	ITEM	ESTIMATE SECTION MILE POST									TOTAL 1/ FOR ROUTE
		180.10	181.20	182.50	182.50	182.90	183.70	185.40	189.60	ETC.	
ALL CARDS	STATE: _____ CODE: _____										
	ROUTE: _____										
CARD 1	1. FINANCE CODE			22	24						
	2. SECTION LENGTH, MILES (0.10)										
	3. CLASS: RURAL (R) or URBAN AREA I.D. (Name and Code)										
	4. MILEAGE INCREMENT: Code (1, 2 or 3)										
	5. ROUTE SIGNIFICANCE: Code (N or L)										
	6. DESIGN SPEED (V)										
	7. BASE YEAR TRAFFIC (1984 ADT)										
	8. TRAFFIC a. Design Year (19) or (20)										
	b. ADT Design Year										
	c. DHV Design Year										
	d. D. Direction Distribution Factor										
	e. T % Trucks Design Year (DHV)										
	f. T % Trucks Design Year (ADT)										
	9. NUMBER LANES TO BE CONSTRUCTED THIS ESTIMATE										
	10. ULTIMATE NUMBER OF THROUGH TRAFFIC LANES										
	11. TYPICAL CROSS-SECTION REFERENCE										
	12. RIGHT-OF-WAY WIDTH: PREVAILING										
	13. MEDIAN WIDTH: PREVAILING										
	14. STATUS OF DEVELOPMENT Dec. 31, 1985 (PR-511)										

	WORK CLASSIFICATION	ESTIMATED COSTS (1,000 DOLLARS)									
CARD 2	1. PRELIMINARY ENGINEERING										
	2. R.O.W. a. Acquisition										
	b. Relocation										
	3. UTILITY ADJUSTMENTS										
	4. EROSION CONTROL, CLEAR, GRUB, GRADE, DRAIN, MINOR STR.										
	5. SUBBASE, BASE, SURFACING, and SHOULDERS										
	6. R.R. GRADE SEPARATIONS				(To be on 11 x 14 x 20 inch						
	7. HIGHWAY GRADE SEPARATIONS WITHOUT RAMPS				sheets in report)						
	8. INTERCHANGES										
	9. OTHER BRIDGES, TUNNELS, and WALLS										
	10. TRAFFIC CONTROL DEVICES										
CARD 3	11. WEIGH STATIONS, PEDESTRIAN and BICYCLE FACILITIES										
	12. SAFETY WORK ON COMPLETED SECTIONS										
	13. NOISE ABATEMENT MEASURES										
	14. ROADSIDE IMPROVEMENT a. Landscape Planting										
	b. Rest Areas and Overlooks										
	15. ALL OTHER ITEMS: Maint.of Traf.,Training,Mobil.,etc.										
	16. SUBTOTAL, LINE 4 thru 15										
	17. CONSTRUCTION ENG'R and CONTINGENCIES, % of line 16										
	18. TOTAL COST OF CONST., LINES 16 and 17										
	19. TOTAL ESTIMATE COST, LINES 1, 2, 3 and 18										

1/ Need only for Route Total Sheet.

3/ Card number indications need not be shown on the final printed tables.

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Exhibit 1

CLASSIFICATIONS TO BE USED FOR REPORTING THE STATUS OF THE INTERSTATE SY

RCS HNG-10-05

STATUS GROUP 1	STATUS GROUP 2	STATUS GROUP 3	STATUS GROUP 4	
Full or acceptable standards and open to traffic. Financed with Interstate funds. Full control of access.	Standards reasonably adequate for and open to present Interstate and local traffic. Financed with Interstate funds. Full or partial control of access.	Under construction, not open to traffic. Financed with Interstate funds.	Preparation of plans, specifications, and estimates, and/or right-of-way acquisition. Financed with Interstate funds.	Desi/nated mileag Financed
1a(1)f - Completed to full Interstate standards. No additional construction required (zero cost section). 1a(1)f*- Completed to acceptable Interstate standards and is a zero cost section. The additional improvement needed to meet full Interstate standards is not justified and will not be made. 1a(2)f - Full or acceptable geometric standards, met, but additional work is underway to bring section to zero cost. 1a(3)f - Full or acceptable standards met, but additional work is necessary (not underway) to bring section to zero cost.	2a(1)f - Currently under construction. Completion of present contracts will bring segment up to full or acceptable Interstate standards (zero cost). Full control of access on present facility. 2a(1)p - Same as above except: Partial control of access. 2a(2)f - No construction work is currently under contract, but additional development is necessary before segment will meet full or acceptable Interstate standards. Full control of access. 2a(2)p - Same as above except: Partial control of access. 2a(3)f - Currently under construction. Completion of present contracts will not bring segment up to full or acceptable Interstate standards. Full control of access. 2a(3)p - Same as above except: Partial control of access.	3a(1)f - Final construction contract completed, but segment is not open to traffic. 3a(2) - Segment is currently under construction. When project is completed, segment will move to open to traffic status (either group 1 or group 2) or to status 3a(1)f. 3a(3) - Segment is currently under construction. At least one more contract is necessary to move segment to open to traffic status.	4a(1) - Preparation of PS&E and right-of-way acquisition underway. 4a(2) - Right-of-way acquisition underway. 4a(3) - Preparation of PS&E underway.	5a(1)e - Public h location 5a(1)p - Same as alignmen 5a(2) - Route la 5a(3) - General Route lo
Financed with other public funds. Full control of access. 1/	Financed with other public funds. Full, partial, or no control of access. 1/	Financed with other public funds. 1/		
1b(1)f - Completed to full Interstate standards. No additional construction required (zero cost section). 1b(1)f*- Completed to acceptable Interstate standards and is a zero cost section. The additional improvement needed to meet full Interstate standards is not justified and will not be made. 1b(2)f - Full or acceptable geometric standards met, but additional work is underway to bring section to zero cost. 1b(3)f - Full or acceptable standards met, but additional work is necessary (not underway) to bring section to zero cost.	2b(1)f - Currently under construction. Completion of present contracts will bring segment up to full or acceptable Interstate standards (zero cost). Full control of access on present facility. 2b(1)p - Same as above except: Partial control of access. 2b(1)n - Same as above except: No control of access. 2b(2)f - No construction work is currently under contract, but additional development is necessary before segment will meet full or acceptable Interstate standards. Full control of access. 2b(2)p - Same as above except: Partial control of access. 2b(2)n - Same as above except: No control of access. 2b(3)f - Currently under construction. Completion of present contracts will not bring segment up to full or acceptable Interstate standards. Full control of access. 2b(3)p - Same as above except: Partial control of access. 2b(3)n - Same as above except: No control of access.	3b(1)f - Final construction contract completed, but segment is not open to traffic. 3b(2) - Segment is currently under construction. When project is completed, segment will move to open to traffic status (either group 1 or group 2) or to status 3b(1)f. 3b(3) - Segment is currently under construction. At least one more contract is necessary to move segment to open to traffic status.		

1/Category (b) shall be maintained for all segments on which Interstate funds have not been obligated. These segments will move to category (a) as soon as Federal Interstate funds (regardless of the amount) have been obligated for their improvement or upgrading.

Exhibit 1

ICATIONS TO BE USED FOR REPORTING THE STATUS OF THE INTERSTATE SYSTEM

RCS HNG-10-05

TUS GROUP 2	STATUS GROUP 3	STATUS GROUP 4	STATUS GROUP 5	STATUS GROUP 6
r and open to present e funds. of access.	Under construction, not open to traffic. Financed with Interstate funds.	Preparation of plans, specifications, and estimates, and/or right-of-way acquisition. Financed with Interstate funds.	Designated mileage. Financed with Interstate funds.	Toll facilities - all stages from route designation to open to traffic.
ction. Completion of bring segment up to full or standards (zero cost). Full ment facility. Partial control of access. currently under contract, but is necessary before segment table Interstate standards. Partial control of access. ction. Completion of not bring segment up to rstate standards. Full Partial control of access.	3a(1)f - Final construction contract completed, but segment is not open to traffic. 3a(2) - Segment is currently under construction. When project is completed, segment will move to open to traffic status (either group 1 or group 2) or to status 3a(1)f. 3a(3) - Segment is currently under construction. At least one more contract is necessary to move segment to open to traffic status.	4a(1) - Preparation of PS&E and right-of-way acquisition underway. 4a(2) - Right-of-way acquisition underway. 4a(3) - Preparation of PS&E underway.	5a(1)e - Public hearings held on route location. (Existing alignment) 5a(1)p - Same as above: Except (Projected alignment) 5a(2) - Route location studies underway. 5a(3) - General location only established. Route location work not started.	6a - Does not apply since Interstate funds are not involved.
blic funds. ntrol of access. 1/	Financed with other public funds. 1/			Financed with toll bonds or other toll facility funds.
uction. Completion of bring segment up to full te standards (zero cost). on present facility. Partial control of access. No control of access. s currently under contract, ment is necessary before or acceptable Interstate ol of access. Partial control of access. No control of access. uction. Completion of not bring segment up to rstate standards. Full Partial control of access. No control of access. ted.	3b(1)f - Final construction contract completed, but segment is not open to traffic. 3b(2) - Segment is currently under construction. When project is completed, segment will move to open to traffic status (either group 1 or group 2) or to status 3b(1)f. 3b(3) - Segment is currently under construction. At least one more contract is necessary to move segment to open to traffic status.			6b(1) - Completed and open to traffic. 6b(2) - Construction work underway. 6b(3) - Segment approved as part of Interstate System. Engineering and/or ROW may or may not be underway.

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MINNESOTA
INTERSTATE ROUTE 94
Date 12-31-85

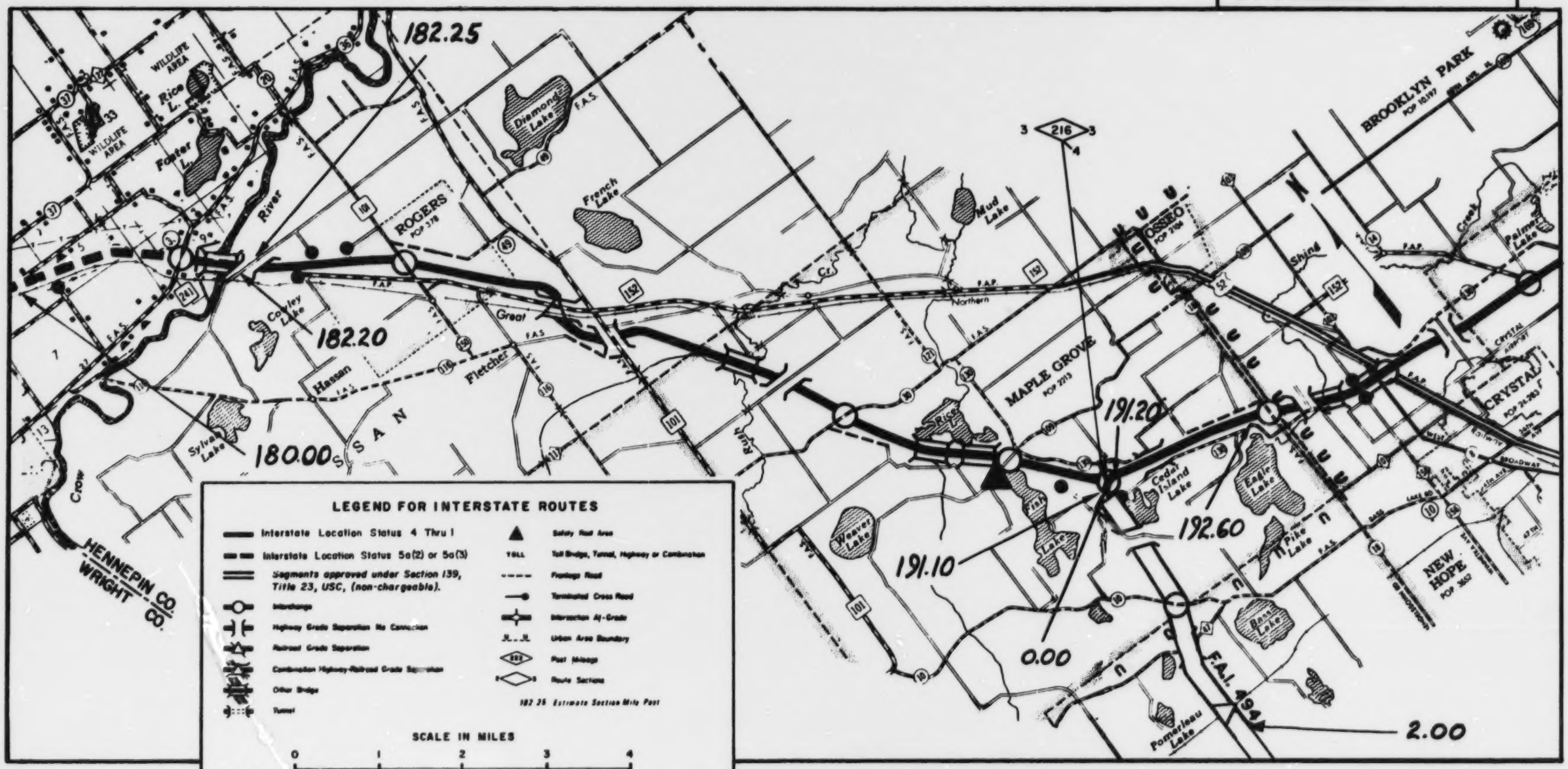

Figure 4

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V - COST ESTIMATE FOR ESTIMATE SECTIONS

The provisions of Section 4(b) of the 1981 highway act have limited the use of Interstate construction funds to construction work necessary to provide a minimum level of acceptable service on the Interstate System and to those design concepts, locations, geometrics, and other construction features included (as eligible and approved) in the 1981 estimate. The preparation of this estimate shall include estimating the cost of remaining essential work necessary to the construction of (1) initial basic construction on gap sections, (2) approved major upgrading on incorporated (non-FAI built) segments, (3) approved stage construction work needed to provide a completed project, and (4) approved added mixed traffic lanes and HOV lanes and associated facilities on FAI built open to traffic sections.

Costs for each section of each Interstate highway which has remaining work are to be estimated on the basis of contract plans, under preparation or final, or in their absence on the basis of sketch plans, field examination of conditions along the approved location, and a reasonably realistic breakdown into components on which separate dollar values can be estimated. Prior determination must be made on each section of the number of through traffic lanes, typical cross section, general drainage design, treatment at each existing crossroad, and other information indicated on the top half of Table B. A summary of the cost estimates for each section is to be reported in the bottom half of Table B about compilations in much greater detail will be necessary to arrive at these estimates in the field. These detailed compilations and work sheets are not to be submitted to Washington. For purposes of uniformity in reporting, the component cost estimates are to be grouped and reported on the lines naming the work classification on the bottom half of Table B as described below.

Cost Estimates by Estimate Sections - Table B Bottom Half

Cost data are to be reported for remaining eligible work for each section shown on Table B and the Strip Map, using the milepost sectioning and finance code as part of the identification. Where dual finance code entries are reported in Table B the costs reported should reflect work actually being proposed under each of the finance codes. Adjacent sections which have zero cost need not be reported or may be combined into one section as outlined at the beginning of Section IV (page IV-1).

General

Every effort must be made to provide documentation and references to sources of data on which the estimate is based. Care must be exercised to prevent mathematical errors, duplications, overstatements and understatements between columns; and to avoid any omission of costs for which expenditures are anticipated. Unidentified costs, "other" or miscellaneous uncategorized work should be held to a minimum.

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The desired accuracy of cost estimates to complete the Interstate System is that obtainable from preliminary plans and profiles from which reasonably accurate quantities may be tabulated and individual components of construction costs may be separately identified and to which representative unit cost values can be applied. Where itemized quantities are available in PS&E form or in preliminary engineering studies, they will be used. There should be a preliminary design plan or layout for every estimate section with eligible cost.

There should be a review of base data used in the estimate by experienced State and FHWA engineers. The review should include a specific determination that remaining work being estimated is work approved for Interstate construction funding, eligible under the redefinition of Section 4(b) of the 1981 highway act and conforms to the design concept location, geometrics and other construction features which were the basis of estimating the eligible costs in the 1981 estimate (exceptions must be specifically approved as discussed in Section I of this manual under "Major Design Revisions.") As a result of this examination, and determination of the separate components of eligible work, it is expected that estimated quantities or a lump sum estimate will be established for all remaining eligible work for each section of the Interstate highway. These should be recorded in some logical and convenient tabular form and used with representative unit or component costs to obtain the section total estimated cost for each line for each section, which is to be reported in the form on the bottom half of Table B. These basic data shall be kept available in a clear form in the State's records. The State highway department general practices for estimating quantities and work shall be followed so that available unit costs can be applied to them. An explanation for each line should be made to clarify the concept of the estimate details if in any instance the preliminary design plans and quantities are not available.

Line 1 - Preliminary Engineering

Include all costs for engineering relating to location studies, public hearings, studies for the analysis and evaluation of environmental impact, development of an environmental document and in general, to the completion of PS&E for any remaining right-of-way and construction projects including those for remaining approved stage construction, for eligible HOV lanes and associated facilities construction and for eligible added mixed traffic lane construction. Generally, all field work, surveys and drawing of right-of-way plats and maps are performed as part of preliminary engineering. The costs for this work should therefore be reported on Line 1. Engineering costs on an estimate section having construction items under more than one finance cost should be separated to the code appropriate to the work for which the engineering is to be performed.

Costs for preliminary appraisals made in connection with location studies and costs for surveys relative to the relocation of people should normally be reported on Line 1. However, where these activities are normally performed under a right-of-way project, their costs should be included in Lines 2a or 2b. Care should be taken to avoid duplication of costs in the estimate.

Preliminary engineering costs relating to utility adjustments should be included in Line 1 if the State (or State's consultant) performs the PE work for the adjustment. Preliminary engineering costs which are included as part of the utility estimate and agreement should be included in the utility work, Line 3. Care should be taken to avoid duplication of costs in the estimate.

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Engineering costs should be based on current, rather than projected experience and any factors or percentages used must be supportable and documented in the State's records. Where engineering costs are developed as a percentage of the construction costs reported on Table B, the amounts so developed must be reduced by engineering work already in authorized status on these sections. Engineering project overruns may be included where the State furnishes supportable, evidence that total costs for a project will substantially exceed the authorized amount shown in the fiscal records as of December 31, 1985. These overruns should be included on active projects, if the overrun is approved for FAI funding and is within the scope of the previously authorized project, changes to the scope of the project which included new work on subsequent phases of work may be included only if such work is eligible under redefinition in the 1981 highway act. These overruns should be included under finance code 22 or other finance codes appropriate to the project.

Line 2 - Right-of-Way

This work should include all costs of remaining right-of-way and relocation assistance needs which are necessary to the construction of the work eligible for Interstate construction funding under the 1981 highway act as discussed in Section I. The 1981 act also provides that the construction necessary to provide a minimum level of acceptable service shall include full access control. A complete identification of the eligible right-of-way and relocation elements, and a discussion on methods of obtaining or developing their costs are included in Appendix B of this manual. The estimate of cost is to be made of the number of parcels which, as of December 31, 1985, had not been authorized for acquisition.

Where the State (or its agent) normally purchases right-of-way or easements for a utility adjustment, such costs should be included in this line. If the right-of-way or easement costs are included as part of the utility estimate or agreement, such costs should be included in the utility work, Line 3.

Include cost of functional replacement and publicly owned land and facilities assigned to the Interstate highway in lieu of market value unless the probability of replacement is remote. Costs of extra right-of-way for the approved stage construction of interchanges and additional lanes, for addition of eligible HOV lanes and associated facilities and for addition of eligible added lanes are also to be included. The cost of land or interests in land for scenic enhancement purposes (scenic lands) outside highway right-of-way may be included only if specifically approved as eligible for Interstate construction funding as an essential environmental requirement on a gap section. Do not include outdoor advertising and junkyard costs or costs of right-of-way for added fringe or corridor parking lots, safety rest areas, scenic overlooks, weigh stations, joint-use projects, or excess right-of-way required to build lanes beyond those allowed in the 1981 highway act.

Costs for construction work to be done to mitigate right-of-way damages are to be reported as construction costs in this estimate. Costs of cattle and machinery passes, moving fences, and replacement in-kind construction work are to be reported as construction costs, even though they are conditions in right-of-way acquisition. (See Lines 4, 7, 9, and 15).

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All estimates shall be developed on a parcel by parcel basis as well as separately for the urban and rural sections. The rural-urban classification of sections shall be based on Federal-aid definition. The right-of-way costs on an estimate section having construction items under more than one finance code should be separated to the code appropriate to the work for which the right-of-way is being acquired.

The estimate shall be based on a preliminary plan or layout showing, as a minimum, the currently approved centerline location, the right-of-way limits, the property lines, the improvements or developments and with enough existing terrain or other features to permit a field examination and evaluation of the proposed land area and relocation needs.

The overall right-of-way and relocation estimates related to work in authorized status may be developed in various ways depending on the individual State's accounting procedures. The following suggested methods are closely related and provide for the inclusion of project overruns in the estimate.

The first method is to estimate and include in the estimate, under the appropriate finance code, only those sections on which no right-of-way and/or relocation work has been authorized by FHWA as of the estimate cutoff date, December 31, 1985. In addition, on those sections where all work has been authorized but there is supportable evidence that the final project costs will substantially exceed the dollar amounts recorded in the fiscal records as of that date, the additional costs (project overruns) may be included in the estimate under finance code 22 or other finance code appropriate to the project. In all cases, the remaining right-of-way needs for a partially authorized project should be in the estimate under the finance code appropriate to the construction work for which the right-of-way is needed.

The second method would be to estimate all costs which are yet to be incurred by the State after the cutoff date on a project basis, add to that the costs expended by the State, and then reduce that amount by the authorized dollar value of the project as reflected in the fiscal records as of the cutoff date. Any supported project overruns on projects where all the work has been authorized may be included in the estimate under finance code 22 or other finance code appropriate to the project while remaining right-of-way needs would be reported under the finance code appropriate to the construction work for which the right-of-way is being acquired.

Line 2a - Acquisition

Include all right-of-way costs as identified and developed in accordance with discussion on pages 2, 3, 4, 5, and 6 of Appendix B. The basic right-of-way elements to be included on this line are: property estimates, incidental expenses, court awards and legal or administrative settlement differentials and costs for right-of-way clearance (excluding clearing and grubbing).

Line 2b - Relocation Payments and Services

The total estimated cost for relocation payments and services as identified and discussed on pages 7 to 11 Appendix B shall be included on this line. Any relocation payments made under a State relocation law in excess of the payments

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required by the Uniform Act should be excluded from the estimate. The estimate for providing relocation payments and services shall include the following items:

1. A parcel by parcel estimate of the cost of moving and other related expenses for families, businesses, farms, and nonprofit organizations to be displaced.

2. A parcel by parcel estimate of the cost of replacement housing payments to homeowners to be displaced. Increased interest costs and closing costs on the replacement dwelling are to be included.

3. A parcel by parcel estimate of the cost of replacement housing payments to tenants and certain others to be displaced, including closing costs in down payments.

4. An estimate of the cost of furnishing relocation assistance services to eligible persons, businesses, farms and nonprofit organizations.

5. An estimate of the cost of providing (building, if necessary) replacement housing as a last resort, where it is expected that the project cannot be built until such replacement housing is made available.

Line 3 - Utility Adjustments

Include costs for relocation and adjustment of utility facilities necessitated by construction of the Interstate highway. Costs to be included in this estimate are those indicated as eligible for FAI participation in FHPM 6-6-3-1 UTILITY RELOCATIONS, ADJUSTMENTS, AND REIMBURSEMENT. Utilities accommodated on Interstate right-of-way must conform with the provisions of FHPM 6-6-3-2 ACCOMMODATION OF UTILITIES. Costs should be reported under the finance code appropriate to the project which requires the utility adjustment (see discussion of Line 4 for details).

Utilities should be separately considered and checks made on similar previous experience, or with the operating companies to estimate the costs of adjustments. Approximation also should be made for costs of adjustments to utilities not readily apparent or not shown on available plans, such as some underground lines in urban areas. The construction engineering and contingencies percentage should be added to this line to make it compatible with prior estimates, as it is not included in construction subtotal.

Line 4 - Erosion Control, Clear, Grub, Grade, Drain and Minor Structures

The work included in this line should be shown under finance code 22 if the work is for initial basic construction on a gap section, under finance code 23 for approved major upgrading projects on non-FAI built sections, and under finance code 21 for approved stage construction to be constructed within the section as discussed earlier in Section I. Within sections which include initial basic construction or approved major upgrading, it is necessary to exclude the costs of additional work, such as added grading and drainage, which will be performed with other than Interstate construction funds in order to incorporate additional features such as rest areas, lanes in excess of maximum

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permitted under the Section 4(b) of the 1981 highway act, weigh stations or joint-use facilities. Within sections where added mixed traffic lanes or HOV lanes and associated HOV facilities on FAI built open to traffic segments are eligible for Interstate construction funding under the 1981 highway act, the work necessary to construct the lanes and associated facilities should be shown under finance code 25.

Include all clearing and grubbing and erosion control on this line. The general scope and character of this work should be used as a basis for establishing lump-sum or per-mile costs.

Demolition and clearing of improvements are now considered right-of-way work for which costs should be included under Line 2. In those instances, however, where clearance or an isolated improvement or major obstruction is to be included in the initial basic construction project, such costs should be reported on Line 4.

Include cost for control of erosion and sediment during construction and for permanent erosion and sediment control measures. Control measures may include measures such as: topsoiling, liming, fertilizing, seeding, sprigging, sodding, incidental vine planting, protective stone or gravel blankets, riprap, asphalt emulsions, vegetative and other mulch protection for slopes and erodible soils; permanent channel linings such as riprap, gabions, vegetative, portland cement and asphaltic concrete; temporary channel lines such as jute mesh, excelsior, and fiber glass roving; and temporary and permanent sediment control measures such as dikes, berms, sedimentation ponds, borrow pit lakes, hay bales, and brush barriers.

Include costs for all work commonly covered in grade and drain construction contracts, except those outside of the Interstate through traffic lanes within interchange areas (Line 8). Include all earthwork preparatory to eligible roadside improvement (as defined in Line 14) channel changes, inlets, surface channels, flumes, dikes, underdrains, outfalls, and minor drainage structures, culverts as usually defined, and special fill treatment for the Interstate roadway. Also include same work for any required frontage roads. Include costs of all new major storm sewer lines, appurtenances, pumping stations and equipment, as along an urban depressed freeway.

Grading and drainage quantities, if not available from PS&E plans, may be estimated based on preliminary plans or layouts with some reference to preliminary grade line. Channel changes and sizable culverts should be separately estimated. Minor drainage facilities such as inlets, cross drains, special fill treatment, etc., can be evaluated on a running length basis. The quantities for frontage roads should be estimated separately. Major storm sewers needed in urban areas should be estimated separately on the basis of a preliminary plan and experience with similar facilities in the general area.

Line 5 - Subbase, Base, Surfacing, and Shoulders

Include costs of all base courses and surfacing or pavement constructed subsequent to the completion of grading, except for that outside the through traffic roadway in interchange areas and that included as decks of bridges and viaducts. Include all base courses and surfacing provided on shoulders and on frontage roads not a part of interchanges. The separate quantities for frontage

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roads outside of interchange areas also should be estimated. The base courses, surfacing, or pavement and shoulders of the through traffic lanes on the Interstate highway through interchange areas are to be reported as a part of this heading. Those for the ramps and all supplemental pavements of interchanges are to be reported under Line 8.

Include the costs for added stages of pavement construction approved in accordance with FHPM 6-2-4-1 under finance code 21 only if the added stages were identified and approved as stage construction at the time of original PS&E approval. Overlays of pre-1963 pavements and skid resistant overlays are not eligible and shall not be included. Costs for work necessary for initial basic construction on a gap section should be included under finance code 22. Costs of work necessary to complete approved major upgrading of segments incorporated into the System eligible for Interstate construction fund participation should be included under finance code 23. Costs of work for approved additional mixed traffic lanes and added HOV lanes on FAI built open to traffic sections if eligible under the 1981 highway act should be included under finance code 25. The costs of additional base courses and surfacing or pavement required to construct lanes in excess of the maximum number allowed in the 1981 highway act must be excluded from the estimate.

Some knowledge or examination of local soil conditions will be necessary to estimate the type and depth of subbase and base courses to be estimated. Where preliminary plans are used, the costs for Line 5 can be determined from quantities on a per-mile basis, with change only where different typical sections apply. Current practice regarding roadway structural design concerning depth and type of surfacing and shoulder treatment should be utilized.

Approved stage construction of pavements may include the pavement overlay which was specifically approved at the time of original PS&E under FHPM 6-2-4-1 as part of the ultimate pavement structure design (including a skid resistant surface) but cannot be pavement grooving or safety overlay projects which have the purpose of renewing skid-resistance characteristics of the pavement.

Line 6 - Railroad Grade Separations

Include all costs incidental to separation of grades at railroads, including structures. Grading and paving costs of the Interstate highway itself are to be reported in Lines 4 and 5. Where a railroad grade separation is combined with a highway separation or with a river bridge, or both, the entire structure should be charged against either Line 6, 7, 8, or 9, depending upon the dominant use which the structure serves. For instance, a long river bridge may include one extra span to serve as a railroad separation structure as well. Under these circumstances, the entire structure cost would be entered under Line 9. Conversely, the cost of a minor stream crossing structure which is complicated in order to provide a railroad separation should be reported under Line 6. Similar reasoning can be followed for combination railroad-highway separation structures (particularly those involving minor crossroads which might often be terminated except for the railroad separation being planned).

Structures are to be estimated in a manner similar to that described for Line 7 and should be reported under the finance code appropriate to the project which will include the structure work. Additional structure work which is required to construct lanes in excess of the maximum number allowed in the 1981 highway act must be excluded from the estimate.

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Line 7 - Highway Grade Separations Without Ramps

Where highway grade separations are approved (as discussed in Section II) as necessary to provide full access control the costs for separating grades of an Interstate highway and a crossroad where access connections are not provided should be included in this line. Structures needed in the construction of a gap section, an approved major upgrading project, or an approved stage construction project under the finance code appropriate to the project which will include the structure or structure modification. This includes costs for all parts of the structure itself together with walls, curbs, railings, and all of the costs for changes to the crossroad, including pumping installations. Costs of crossroad grading, erosion control, surfacing, drainage, etc., are to be reported here and not under Lines 4 and 5. The cost of cattle passes and machinery passes combined with a minor road crossing are to be reported here and not under Line 15.

The added costs of added structure spans and nominal added width which are found to be cost-effective and approved to minimize impacts on wetlands, Section 4(f) properties, or other environmental impacts of the construction on a structure which has the predominant purpose of providing grade separation (railroad, highway or stream) on an initial basic construction or approved major upgrading project need not be separated but should be shown under the finance code appropriate to the project which includes the structure. The costs of structures which must be modified or built incidental to the construction of approved added mixed traffic lanes or approved HOV lanes and associated facilities should be included under finance code 25. Additional structure spans or width of structure required to accommodate the construction of lanes in excess of the maximum number allowed in the 1981 highway act must be excluded from this estimate.

Each Interstate structure should be estimated and recorded separately on the State's work sheets. Where a type and size is likely to be nearly the same as other structures, fairly detailed estimates should be made to establish typical total costs. These typical total cost values may be utilized, with adjustment, such as for more extensive walls, length and width variations, etc., to obtain estimate of cost for individual structures. Estimates for this line also require separate determination of type of highway and participating length of crossroad adjustments. Developed typical cost values for anticipated crossroad treatment and for similar terrain conditions also may be used to advantage here.

Line 8 - Interchanges

Where interchanges are necessary in the construction of a gap section, an approved major upgrading project, approved stage construction or facilities associated with eligible HOV lanes on FAI built open to traffic sections include all costs of erosion control, clearing and grubbing, excavation, structures, walls, grading, drainage, pumping installations, and the surfacing of all ramps, curbs, slope treatment, contour grading work, traffic control devices, lighting, and signing (including advance and post-interchange signing on main line). Include the costs for the entire improvement of the crossroad, unless the crossroad is another Interstate route. Only include the costs of interchange modification which is directly incidental to and necessitated by the construction of approved added mixed traffic lanes on FAI built open to traffic sections under finance code 25. Where the interchange construction is necessary

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or associated with the construction of approved eligible HOV lanes on FAI built open to traffic sections the costs of associated facilities such as ramps, fringe parking lots, signing and traffic control devices necessary to the HOV lanes should be reported on Line 8 under finance code 25. According to Section 127 of the 1982 STAA parking facilities should be reported on line 8 under finance code 25.

Exclude the cost of rights-of-way and utility adjustments and for grading, drainage, and surfacing of the Interstate through traffic lanes. Exclude also motorist services signs which will be included in Line 10. It should be noted that Line 8 cost estimate is for the "complete" interchange (with the exceptions noted).

Detailed estimates should be made to establish costs of typical cases for general types and extensions of ramps and crossroad improvement, such as diamond, two-quadrant, or full cloverleaf interchanges.

In urban areas, where interchanges are frequent and entail many nontypical features, small-scale layouts are necessary since estimates to the desired accuracy cannot be made without a preliminary design layout. Directional interchanges obviously require a preliminary design and separate estimate.

Cost of interchanges between two Interstate highways are to be reported under Line 8 on one route (the gap section if one route is to be built). Costs under Lines 3, 4, and 5 and mileage (to the intersection of their centerlines) of the through traffic lanes are to be reported for each of the intersecting Interstate routes.

Costs for construction of new interchanges and for modifications or improvements to existing interchanges which have been approved for FAI funding as part of the approved initial basic construction on gap sections or approved major upgrading on incorporated (non-FAI built) segments should be included in this line under finance code 22 or 23 as appropriate.

Costs for approved added interchanges, proposed interchange safety upgrading work (including ramp additions or revisions), and other safety improvements at interchanges on otherwise completed sections should not be included in the estimate. All safety work on completed sections may be funded with 4R funds authorized by the 1981 highway act.

The costs of special purpose ramps or interchanges approved for construction on otherwise completed sections to provide access to the Interstate from public transportation facilities, fringe and transportation corridor parking facilities, exclusive or preferential use lanes (except HOV lanes eligible under the 1981 highway act), or other special use facilities are not eligible for Interstate construction funding but may be funded with 4R funds authorized by the 1981 highway act.

Line 9 - Other Bridges, Tunnels, and Walls

Include all costs for all structures other than those included in Lines 6, 7, and 8 above. Primarily this will cover all stream bridges, tunnels, and viaducts on the Interstate highway. Include all costs in the manner indicated for Line 7 under the finance code appropriate to the project which will include

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the structure or wall. The necessary channel changes that may be part of the major stream crossings should be reported under Line 4. Grading and paving of the approaches are to be reported in Lines 4 and 5. Costs to be divided between two States are to be reported in a manner consistent with the likely proportion of the total to be financed by each State even though the location of the State line breakpoint may suggest otherwise. This might apply where a State line is on one shore of a river, across which bridges are financed equally by both States.

The costs of tunnel construction work proposed to provide a special use or joint-use tunnel which is not specifically determined to be an essential environmental requirement should be limited on this line to the finance code that applies to work necessary to open the Interstate gap section to traffic service (Finance Code 22). As an example, the ineligible portion would include the cost of added height for columns and walls, the cover slab and supporting members, ventilation and other systems, and any joint-use grading and drainage on the cover slab. This portion shall not be included in the estimate.

Include costs for all retaining walls along the Interstate highway, except those reported under Lines 6 through 8 as a part of other structures or interchanges. On some sections of urban Interstate highways, and possibly also in mountains, extensive wall sections may be necessary. Walls can entail substantial construction costs and should be estimated separately. Costs are to be reported under the finance code appropriate to the project which includes the wall construction. Eligible costs of walls to be constructed as a noise abatement measure should be included in Line 13. The cost of any added wall height to provide for noise abatement need not be separated from Line 9 or 13 applicable to the predominate purpose of the wall.

Line 10 - Traffic Control Devices

Include under eligible finance code costs of all roadway appurtenances and traffic control devices that are eligible for FAI construction funding under the 1981 highway act. Items which are no longer eligible such as proposed safety improvements or upgrading of signs and signals to current standards and traffic requirements on completed sections (which may be funded with 4R funds) may not be included. All traffic control device work located in interchanges will be reported in Line 8.

Costs estimated for guardrail and fencing and for lighting and traffic control devices outside of interchange areas probably can be established on a typical cost per mile basis for the different terrain and roadside conditions.

Include in this line under the appropriate finance code (21, 22, or 23) the costs of traffic control devices (outside of interchanges). Include work such as motorist service signs, lane markings, striping, or other control devices, new fences along or within the right-of-way, and guide rail and lighting necessary to open a gap section to traffic service (finance code 22), approved major upgrading on an incorporated (non-FAI built) segments (finance code 23) and approved stage construction (finance code 21).

Traffic control devices directly associated with the construction of added mixed traffic lanes or HOV lanes eligible under the 1981 highway act should be included under finance code 25.

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Costs of revised signing, motorist-aid systems, electronic control and communication systems and traffic surveillance and control systems are not eligible for Interstate construction funding but may be funded with 4R funds authorized by the 1981 highway act.

Line 11 - Weigh Stations, Pedestrian and Bicycle Facilities

The costs of truck weighing stations (including ramp connections, parking areas, scales, scale houses and related facilities), are not eligible for Interstate construction funding but may be funded with 4R funds authorized by the 1981 highway act.

Pedestrian overpasses or underpasses (including bridle and bicycle path crossings), bicycle, pedestrian and equestrian trails and control devices are generally not eligible for Interstate construction funding but may also be funded with Interstate 4R funding. Only the cost of such work that is found necessary to provide for continuity of travel may be reported as an eligible cost under the finance code appropriate to the project.

Line 12 - Safety Work on Completed Sections

The construction costs of all safety improvements identified under the safety program requirements of FHPM 8-2-3 and to be made on previously completed sections are not eligible for Interstate construction funding but may be funded with 4R funds authorized by the 1981 highway act.

The added costs for safety features which are provided as part of the design for an initial basic construction on gap sections or approved major upgrading project on incorporated sections or for safety features which had been planned to be added later as a stage construction item to projects now underway or already completed should not be included in this line. Replacement of safety features which are affected by the construction of approved added mixed traffic lanes or HOV lanes on FAI built open to traffic sections and considered incidental to that eligible construction work should also be reported on other lines under finance code 25.

Line 13 - Noise Abatement Measures

Include in this line costs for noise abatement measures determined to be essential environmental requirements on initial basic construction of gap sections or on approved major upgrading of incorporated (non-FAI built) sections. Noise barriers, measures to noise insulate structures, and buffer zones which are found to provide overall noise abatement benefits which are determined to outweigh the overall adverse social, economic and environmental effects of these measures, and if the measures mitigate a specific impact of the project, costs may be included in the estimate under the finance code (22 or 23) appropriate to the project. Preliminary engineering costs and right-of-way costs (acquisition or easements for barriers) should be reported in Lines 1 and 2. Right-of-way costs specifically associated with buffer zones should be included in Line 13. The additional costs on a section necessitated by the inclusion of walls, berms (on incorporated sections) and other noise barriers for the specific purpose of noise abatement are to be reported on this line and should not be duplicated on Lines 9 and 15.

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Costs for noise abatement measures should not be included as eligible work in the estimate on open to traffic segments unless the work is required as part of an approved major upgrading project on an incorporated segment under finance code 23 or as stage construction approved at the time of original PS&E under finance code 21. The costs of noise measures proposed as part of an eligible project for the addition of mixed traffic lanes on FAI built segments may be funded with 4R funds authorized by the 1981 highway act.

Costs may be included under appropriate finance code (22 or 23) for acquisition of uneconomic remnants or remainders which are undeveloped or predominately undeveloped land for Type 1A projects (either in fee or a lesser interest) for providing buffer zones on projects for the construction of gap sections or approved major upgrading for the purpose of noise attenuation where the acquisition is determined to be an essential environmental requirement. Methods for estimating such right-of-way costs are outlined under Line 2 of this section and in Appendix B.

Line 14 - Roadside Improvement

Only the essential roadside improvement work will be included in this estimate. Such costs for control of erosion and sediment during construction and for permanent erosion and sediment control measures will be reported on Line 4, including those for interchanges.

Line 14a - Landscape Planting

Generally, landscaping is not eligible for Interstate construction funds. Landscaping work may be included in the estimate for essential environmental requirements. Such work, to be considered essential, must be in unique settings where preservation of visual quality, habitat preservation, or other mitigation is needed to prevent a severe impact of the highway. Other landscaping work is not eligible for Interstate construction funding and shall not be included in this estimate. Such work is eligible for Interstate 4R funds.

Line 14b - Rest Areas and Overlooks

If rest area and scenic overlook work is found to be necessary to replace existing similar services on gap sections (finance code 22) or as part of the approved major upgrading of an incorporated segment (finance code 23), costs for speed change lanes, entrance and exit roadways, circulatory roads, parking areas, walkways, curbs, lighting installation, and replacement of other existing similar services may be included in the estimate. Costs of preliminary engineering and right-of-way are to be reported in Lines 1 and 2, respectively.

Except as outlined above, excluded from construction costs to be reported in this estimate are the costs for both construction and completion of improvement of rest areas and scenic overlooks; and the cost of any upgrading of water supply facilities, sewage treatment facilities, and access provisions to serve the handicapped. The costs of work not eligible for Interstate construction funding is eligible for 4R Interstate funds.

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Line 15 - All Other Items

Include under the finance code appropriate to the project the costs of any eligible construction work not properly reported under the above headings. This includes any costs of construction of detours or operation of traffic during construction not normally included in Lines 4 to 9, and costs for that portion of a relocation of an existing highway or railroad, made in lieu of an Interstate separation. All such costs require separate determination and an estimate, and are to be a part of the State's work sheets. Costs of machinery and cattle passes not involving a public road are to be reported here and not under Line 7.

Appropriate costs for training programs under FHPM 6-4-1-2 EQUAL EMPLOYMENT OPPORTUNITY ON FEDERAL-AID HIGHWAY CONSTRUCTION CONTRACTS INCLUDING SUPPORTIVE SERVICES should also be included in this line. Each State's estimate of cost for this item should be based on their current procedures or guidelines for selecting projects and for determining the number of trainees to be assigned to each. In developing a reasonable and supportable estimate of costs, consideration must, of course, be given to the cost of remaining work to complete the system, the remaining work to complete the system, the remaining years in the Interstate program and the latest minimum annual training goals furnished by the Washington Headquarters. The training costs included in this estimate should be only those costs that are eligible for Federal-aid Interstate funding, not including supportive service funds, and their method of development should be specifically identified and documented in the State's estimate work papers for future reference.

In those States where mobilization costs are bid as a separate contract item, the estimated costs for such work shall be included in this line. In all other States, the cost of this work is, of course, reflected in the various contract bid items and will therefore be included in any of the other lines as applicable.

Line 16 - Subtotal

Enter the total of Lines 4 through 15.

Line 17 - Construction Engineering and Contingencies

The construction engineering and contingency percentage shall be based on a statewide cost of construction engineering as a percentage of construction costs during 1985 on Interstate projects. The total is not to exceed 15 percent of the entry on Line 16, unless justification for a higher percentage has been approved by the FHWA regional office; in which case this may be as high as 20 percent including contingency. All contingency allowances to be included in the estimate are to be shown here.

Line 18 - Total Cost of Construction

Enter the total of Lines 16 and 17.

Line 19 - Total Estimated Cost

Enter the total in Lines 1, 2, 3, and 18.

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Table C

Cost Estimates - State Totals

The right column in Table C (page V-15) should show State totals for all routes with remaining costs eligible for Interstate construction funding (finance codes 21, 22, 23 and 25).

Table D

Reporting Costs of Interstate Bond Issue, ACI and Advance Acquisition Projects

The Section 4(b) of the Federal-Aid Highway Act of 1981 allows Interstate construction funds to be obligated for all advance construction Interstate projects approved before and/on the date of enactment (December 29, 1981). Such projects are reported in Table D (page V-17) and may include all Interstate Bond Issue, ACI and Advance R/W Acquisition projects approved prior to enactment. Projects approved after December 29, 1981, shall be included only if the projects are for Interstate construction eligible under Section 4(b) of the act.

a. Interstate Bond Issue Projects

In those States in which work on the Interstate Highway System is completed or in authorized status as of December 31, 1985, having been financed in accordance with 23 U.S.C. 122, and for which the State expects to claim reimbursement, the most accurate costs available for such work may be included in the estimate and reported on Table D (See FHPM 1-4-8 BOND ISSUE PROJECTS). The costs reported shall not include payment of interest on such bonds and incidental costs in connection with the sale of such bonds. Projects in this category are to be reported showing route number, estimate section, project number, whether rural or urban, work class, total project costs including the amount of Federal funds and the amount of State-matching money. A tabulation will be furnished by the Washington Headquarters of the FHWA for checking and correlation purposes.

Interstate Bond Issue Projects are not to be reported in Tables B or C.

b. ACI Projects

In those States where work is completed or in authorized status as of December 31, 1985, having been advanced in accordance with 23 U.S.C. 115, and for which the State expects to claim reimbursements, the most accurate costs available for such work shall be reported on Table D. Projects in this category are to be reported showing route number, estimate section, project number, whether rural or urban, work class, total project costs including the amount of Federal funds and the amount of State-matching money. A tabulation will be furnished by the Washington Headquarters of the FHWA for checking and correlation purposes.

ACI Projects are not be reported in Tables B or C.

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c. Advance Right-of-Way Acquisition Projects

In those States in which there are right-of-way advance acquisition revolving fund projects in authorized status as of December 31, 1985, having been authorized in accordance with 23 U.S.C. 108(c), the most accurate costs available for such projects shall be reported on Table D. These projects are to be reported in the same manner as the above Bond and ACI projects. A tabulation will be furnished by the Washington Headquarters of FHWA for checking and correction purposes.

These Advance Acquisition Projects are not to be reported in Table B or C.

d. Preliminary Engineering Projects

In those States where the cost for preparing the 1987 estimates are to be funded under a preliminary engineering project, the cost of such projects are to be reported in Table D, under the heading estimate section enter estimate preparation if such projects were not obligated prior to December 31, 1985.

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SHEET _____ OF _____ SHEETS

TABLE C - COST ESTIMATES BY ROUTES AND STATE TOTAL
STATE _____

(Includes Only Those Costs and Associated Mileage Eligible for FAI Funding, Finance Code 21, 22, 23 and 25)

Interstate Route Number							Total 1/
Length, miles							
1. PRELIMINARY ENGINEERING							
2. R.O.W. a. Acquisition							
b. Relocation							
3. UTILITY ADJUSTMENTS							
4. EROSION CONTROL,CLEAR,GRUB,GRADE,DRAIN,MINOR STRUCT.							
5. SUBBASE, BASE, SURFACING, and SHOULDERS							
6. R.R. GRADE SEPARATIONS		(To be on 11 x 14 to 20 inch sheets in report)					
7. HIGHWAY GRADE SEPARATIONS							
8. INTERCHANGES							
9. OTHER BRIDGES, TUNNELS, and WALLS							
10. TRAFFIC CONTROL DEVICES							
11. WEIGH STATIONS, PEDESTRIAN and BICYCLE FACILITIES							
12. SAFETY WORK ON COMPLETED SECTIONS							
13. NOISE ABATEMENT MEASURES							
14. ROADSIDE IMPROVEMENT a. Landscape Planting							
b. Rest Areas and Overlooks							
15. OTHER ITEMS: Maint. of Traf., Training, Mobil., etc.							
16. SUBTOTAL, LINE 4 thru 15							
17. CONSTRUCTION ENG'R and CONTINGENCIES % of line 16							
18. TOTAL COST OF CONST., LINES 16 and 17							
19. TOTAL ESTIMATE COST, LINES 1, 2, 3 and 18							

1/ This colum only necessary on last sheet

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TABLE D COST OF INTERSTATE BOND, ACI AND ADVANCE

ACQUISITION PROJECTS

(Projects completed or in authorized status as of January 1, 1986)

STATE _____

Interstate Route	Estimate Section	Project No.	Work Class	Rural or Urban	Actual or Estimated Project Costs*		Total Cost ($1000)
					Federal (I) Funds ($1000)	State Matching ($1000)	
					Report Costs (1,000 dollars) (To be on 11 x 14 to 20 inch sheets in the reports)		
TOTAL							

The above projects are not included in Table B or Table C.

*Use most accurate cost available at the time of "closing of the books" for the estimate.

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VI - NATIONAL SUMMARY REPORT

From the separate data submitted by each State the FHWA Washington Headquarters will compile national totals of the estimate to complete the Interstate System and prepare the material to be submitted to the Congress. It is expected that this report will include the following:

General explanation of the estimate and the basis on which it was prepared, including this manual.

Copy of the report as furnished the FHWA by each State highway department with errata sheets.

National map of the Interstate System.

National table of deductions in the general form of Table 3. (Page VI-3)

National summary table in the general form of Table 4. (Page VI-4)

Apportionment Table - Table 5. (Page VI-5)

Summary of total system costs.

Recommendations to the Congress concerning factors for apportionment of Federal-aid Interstate funds for the fiscal years 1989 and 1990.

An approximation of total costs to complete the Interstate System.

This undoubtedly will be a printed report and copies will be furnished to all parties concerned.

Table 3 will be prepared in the Washington Headquarters. The amounts on this table will include the Interstate funds and State-matching funds for the fiscal year 1988 apportionment and for the unobligated balance of Interstate monies on January 1, 1985, adjusted for reductions due to withdrawals under 23 U.S.C. 103(e)(4), and transfers under 23 U.S.C. 119.

Table 4 will also be prepared in the FHWA Washington Headquarters. Column 2, 3, and 4 will show the State totals from their C Tables. Costs shown in Column 5 are to be the State totals from Table D, for ACI, Bond, and QI Projects. Costs shown in Column 6 are the summation of values in Columns 2 through 5. In Column 7 is shown the total of funds available, taken from Table 3. Column 8 shows the total net estimated cost of completing the Interstate System.

Table 5 will also be prepared in FHWA Headquarters. Column 1 shows the net estimated cost of completing the Interstate System. This is the estimated additional funds needed taken from Column 8 on Table 4. Column 2 is the Federal share of the costs shown in Column 1. Column 3 will be the ratio of the Federal share of the sum of the remaining total estimated costs in any State to the Federal share of the sum of the remaining estimated costs in all States.

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The report to the Congress will also include a tabulation of total System costs in which will be shown the cost to complete the System as reflected in the 1987 estimate, the obligations prior to January 1, 1985, and the related program costs for planning, research, administration, contingencies, etc. The summary will be similar to that reported to the Congress in Committee Print 99-1, 99th Congress, 1st Session, January 1985.

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TABLE 3 - SUMMARY OF AMOUNTS NOT INCLUDED IN COSTS USED TO DETERMINE APPORTIONMENT FACTORS 1987 ESTIMATE
(Thousands of dollars)

State	* Interstate funds Apportioned for fiscal year 1988	Estimated State funds to Match Apportionment for fiscal year 1988	* Unobligated Balance of Interstate funds as of Jan. 1, 1986	Estimated State funds to Match Unobligated Balance Int. funds Jan. 1, 1986	Total
Alabama Alaska Arkansas etc.					

* The totals in these columns will not include the 1-1/2% HPR funds.

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TABLE 4 - NATIONAL SUMMARY OF ESTIMATED COSTS, 1987 ESTIMATE
(Thousands of dollars)

State	Preliminary Engineering	Right-of-Way	Construction	Interstate Bond Projects and Advanced Construction Projects (Table D)	Subtotal	Amounts Already Available (See Table 3)	Estimated Federal-aid and State matching money required to complete system
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Alabama							
Alaska							
Arizona							
Arkansas							
etc.							

TABLE 5 - ESTIMATED FEDERAL-AID AND STATE MATCHING FUNDS TO COMPLETE THE SYSTEM AND APPORTIONMENT FACTORS FOR DISTRIBUTION OF 1989 AND 1990 FISCAL YEAR AUTHORIZATIONS

STATE	Estimated Federal-aid and State matching funds required to complete system (thousands)	Estimated Federal share of funds required to complete system (thousands)	Apportionment factors (percent)
ALABAMA ALASKA ARIZONA ARKANSAS CALIFORNIA COLORADO			

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APPENDIX A

DATA PROCESSING INSTRUCTIONS

FOR

THE 1987 ESTIMATE

OF THE COST OF COMPLETING

THE INTERSTATE SYSTEM

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General Information and Controls
1987 Interstate Cost Estimate

Mainframe Computer Programs

Data to be reported for the 1987 Interstate Cost Estimate (ICE) is essentially the same basic data that was reported on the 1985 ICE, and previous estimates.

Punched and interpreted cards representing the data on Table B are no longer necessary for the estimate submittal when tapes are used. If the data on Table B is submitted on tape, whether in card format or in master file format (as a result of using the edit program) cards are not needed. If the data is not submitted on tape, punched cards will be necessary as in past estimate submittals. The data on Table B must be submitted in card format as shown on the layout in this Appendix or in master file format.

As in past estimates, an edit program is available for use by State highway departments requesting it. The edit program has been modified to calculate values for Lines 16, 17, 18, and 19. Any put in values will be replaced with machine values and will be flagged if different. It will be necessary to specify a statewide engineering and contingency rate for use in the calculations.

An ICE Table Print Program is also available for those wishing to use data processing equipment to print the tables. This program now has the capability of printing the Table B and Table C.

These programs will be transmitted on a "mini" computer tape to any State highway department wishing to use them. The "mini" tape may be used to submit the 1987 estimate data.

Micro-Computer Programs

Table B is divided into two major parts. Microcomputer programs to aid in the conduct of the 1987 ICE are being developed. These programs will provide a full screen input with verification, data output for submittal on a diskette, and printed B and C tables. Details will be distributed at a later date.

Data Format

The top half (card 1) is reserved for reporting the identification items, the Traffic and Design Classification and the Status of Development. The bottom half (card 2 and 3) is for reporting the cost of the various construction and right-of-way items.

Data reported in each column of Table B should be coded and keypunched into three separate data cards. The type of data to be coded and keypunched in each card is identified in the listing below. Instructions for coding and keypunching each data item are discussed in detail in this appendix.

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COMPUTER CARD LAYOUT FORM

CARD 1. DATA ON TABLE B
TRAFFIC DATA AND
DESIGN CLASSIFICATION

	Card Control 1	State	FAI Route Number		Milepost (0.01 mile)	Finance Code	Section Length (0.01) mile	Class: Rural (R) or Urban Area Code	Mileage Inc. 1, 2 or 3	Route Significance N or L	Design Speed (V)	Base Year Traffic 1980 ADT	Traffic - Design Year: Year	ADT	DHV	Directional Dist. Factor	Percent Trucks DHV	Percent Trucks ADT	No. of Lanes: To Be Constructed This Estimate	No. of Lanes: Ultimate Through	Right-of-Way Width Prevailing - Ft.	Median Width Prevailing-Feet	Status of Development PR-511	Typical Section Cross Reference Number
FIELD COLUMN	1	2	3		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	22a
	1	2 3	4 6	7	8 12	13 14	15 18	19 21	22	23	24 25	26 31	32 33	34 39	40 44	45 46	47 48	49 50	51 52	53 54	55 58	59 62	63 66	67 74

CARD 2. DATA ON TABLE B
COSTS BY WORK CLASSIFICATION
LINE 1 - 10

	Card Control 2	State	FAI Route Number		Milepost (0.01 mile)	Finance Code	Line 1: Preliminary Engineering	Line 2: Right-of-Way a. Acquisition	Line 2: Right-of-Way b. Relocation	Line 3: Utility Adjustments	Line 4: Erosion Control, Clear & Grub, Grade, Drain, Minor Struct.	Line 5: Subbase, Base Surfacing & Shoulders	Line 6: R.R. Grade Separations	Line 7: Highway Grade Separations Without Ramps	Line 8: Interchanges	Line 9: Other Bridges, Tunnels, and Walls	Line 10: Traffic Control Devices
FIELD COLUMN	1	2	3		4	5	23	24	25	26	27	28	29	30	31	32	33
	1	2 3	4 6	7	8 12	13 14	15 19	20 25	26 31	32 36	37 41	42 46	47 51	52 56	57 61	62 67	68 72

CARD 3. DATA ON TABLE B
COSTS BY WORK CLASSIFICATION
LINE 11 - 19

	Card Control 3	State	FAI Route Number		Milepost (0.01 mile)	Finance Code	Line 11: Weigh Stations Pedestrian & Bicycle Facilities	Line 12: Safety Work on Completed Sections	Line 13: Noise Abatement Measures	Line 14: Roadside Impr a. Landscape Planting	Line 14: Roadside Impr b. Rest Areas & Overlooks	Line 15: All Other Items; Maint. of Traffic, Training, Mobil., etc.	Line 16: Subtotal Lines 4 thru 15	Line 17: Const. Engr. & Contingencies % of Line 16	Line 18: Total Cost of Construction Lines 16 and 17	Line 19: Total Estimated Cost Lines 1, 2, 3 & 18
FIELD COLUMN	1	2	3		4	5	34	35	36	37	38	39	40	41	42	43
	1	2 3	4 6	7	8 12	13 14	15 19	20 24	25 29	30 33	34 37	38 42	43 48	49 53	54 59	60 65

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Items, Coding Arrangement and Codes

The first column on each of the three identifies the type of data to be coded on the code sheets and to be punched in the data processing cards.

See card number with title or identification for each on page A-3.

The next 13 columns (columns 2 through 14 are the identifying data and are identical on each of the three cards. Coding instructions and sample coding are shown for each item on each card, except that the identical items (columns 2 through 14) are shown only under Card 1 for Table B, and are referred to in the instructions for Cards 2 and 3.

Card 1, Top Half Table B

Traffic Data and Design Classification

Field 1. Card Identification — Column 1

Card No.	Code
1	1

Field 2. State — Columns 2,3

Name	Code	Name	Code	Name	Code
Alabama	01	Maine	23	Ohio	39
Arizona	04	Maryland	24	Oklahoma	40
Arkansas	05	Massachusetts	25	Oregon	41
California	06	Michigan	26	Pennsylvania	42
Colorado	08	Minnesota	27	Rhode Island	44
Connecticut	09	Mississippi	28	South Carolina	45
Delaware	10	Missouri	29	South Dakota	46
District of Columbia	11	Montana	30	Tennessee	47
Florida	12				
Georgia	13	Nebraska	31	Texas	48
Hawaii	15	Nevada	32	Utah	49
Idaho	16	New Hampshire	33	Vermont	50
Illinois	17	New Jersey	34	Virginia	51
Indiana	18				
Iowa	19	New Mexico	35	Washington	53
Kansas	20	New York	36	West Virginia	54
Kentucky	21	North Carolina	37	Wisconsin	55
Louisiana	22	North Dakota	38	Wyoming	56

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Field 3. FAI Route Number

a. Number (Right Justified and Insert Leading Zeros) — Columns 4,5,6

b. N E W S (Col. 7 to be Zero where Route Number does not include N E W S) — Column 7

Route Number	Code
4	0040
10	0100
210	2100
495	4950
80N	080N
35E	035E
5W	005W
70S	070S

etc.

Field 4. Milepost — Columns 8,9,10,11,12

To establish a tie between the ICE and the PR-511, Status of Development Records, the milepost was selected to replace the letter-number combination for identifying estimate sections in the 1979 ICE and subsequent estimates. The milepost is purely numeric and must be coded and keypunched on each of the data cards in columns 8 through 12 without the use of the decimal point. ONLY THE BEGINNING MILEPOST FOR THE ESTIMATE SECTION NEEDS TO BE CODED & KEYPUNCHED IN THIS FIELD.

Milepost No.	Code
0.00	00000
0.03	00003
0.20	00020
1.57	00157
10.04	01004
96.80	09680
145.60	14560
436.01	43601

etc.

Field 5. Finance Code — Columns 13,14

The finance code (F.C.) is part of identifying fields (ID) and must be coded and keypunched in columns 13 and 14 of each of the three cards. The appropriate codes are obtained from pages ___ of the Instruction Manual.

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F.C.	Code
21	21
22	22
23	23
25	25

Zero Cost Sections (F.C. 10 & 20) Optional

a) For zero cost sections, report code and keypunch all data required on the top half of Table B (Card #1).

b) Report zero cost on Line 19 of Table B and leave all cost for all other line items blank.

c) Code and keypunch only the identification field on cards 2 and 3 and leave all cost data blank.

Field 6. Section Length — Columns 15,16,17,18

Code the mileage to 0.01 mile.

Miles	Code
0.05	0005
0.10	0010
0.50	0050
1.05	0105
10.12	1012
10.50	1050

etc.

Where an estimated section has two columns of data reported in Table B with differing finance codes (double coded section), the section length (miles) should only be reported under one column and the second column should show zero mileage.

If finance codes on a double coded section both indicate Interstate construction funding eligibility, then the mileage should be coded and keypunched under the finance code which includes the major work on the section.

Toll segments approved for Interstate construction funding but where tolls are still being collected, such as a portion of I-75 in Florida (Alligator Alley), the West Virginia Turnpike (I-77), etc., the mileage should be reported under finance code 21, 22, 23, or 25 with a status group 6 in field 22.

Field 7. Class: Rural (R) or Urban Area Code — Columns 19,20,21

If the Interstate section is rural; code and keypunch an R in column 21, and columns 19 and 20 remain blank. ("R" must be right justified.)

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If the sections are urban; only the urban area code (as shown below) is to be coded and keypunched is this field.

Class: Rural (R) or Urban Area Code		Code
	Rural	R
(Urban Area Name)	Phoenix	016
	Chicago, Ill.	157

etc.

The following list of urban areas with their respective codes must be used. If additional urban area codes are needed for areas not shown, FHWA Headquarters should be contacted so that numbers will not be duplicated. Phone 202-426-0404.

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STATE	STATE CODE	URBAN AREA	URBAN CODE
ALABAMA	01	ANNISTON-OXFORD	009
		ATHENS	012
		AUBURN-OPELIKA	006
		BIRMINGHAM	001
		CULLMAN	013
		FT. PAYNE	014
		GADSDEN	002
		GREENVILLE	011
		HUNTSVILLE	010
		LANETT	007
		LEEDS	008
		MOBILE	003
		MONTGOMERY	004
		PELL CITY	015
		TUSCALOOSA	005
ARIZONA	04	AVONDALE	024
		ELOY	021
		FLAGSTAFF	022
		GREEN VALLEY	026
		HOLBROOK	025
		KINGMAN	020
		NOGALES	018
		PHOENIX	016
		TUCSON	017
		WINSLOW	023
		YUMA	019
ARKANSAS	05	ARKADELPHIA	037
		BENTON	033
		BLYTHEVILLE	042
		BRINKLEY	041
		CONWAY	034
		FORREST CITY	035
		FORT SMITH	031
		HOPE	039
		LITTLE ROCK	032
		MORRILTON	038
		RUSSELLVILLE	040
		TEXARKANA (TEXAS)	630
		WEST MEMPHIS	036
CALIFORNIA	06	ANDERSON	069
		AUBURN	054
		BARSTOW	056
		BEAUMONT-BANNING	057
		BLYTHE	059
		DAVIS	073
		EL CENTRO	060
		FAIRFIELD	072
		INDIO	061
		LAKE ELSINORE	807
		LIVERMORE	806
		LOS ANGELES-LONG BEACH	046
		PERRIS	809
		PLEASANTON	058

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STATE	STATE CODE	URBAN AREA	URBAN CODE
CALIFORNIA (cont.)		RED BLUFF	068
		REDDING	064
		SACRAMENTO	048
		SAN BERNARDINO-RIVERSIDE	049
		SAN DIEGO (OCEANSIDE-CARLSBAD)	050
		SAN FRANCISCO-OAKLAND (BENICIA, MARTINEZ, WALNUT CREEK)	051
		SAN JOSE	052
		SAUGUS-NEWHALL	075
		STOCKTON	053
		SUN CITY	808
		TRACY	074
		VACAVILLE	066
		VICTORVILLE	071
		WOODLAND	047
		YREKA	070
COLORADO	08	COLORADO SPRINGS	076
		DENVER	077
		FORT COLLINS	082
		FORT MORGAN	079
		GRAND JUNCTION	081
		PUEBLO	078
		TRINIDAD	080
CONNECTICUT	09	BRIDGEPORT	086
		CLINTON	099
		DANBURY	094
		GROTON	095
		HARTFORD	087
		MERIDEN	088
		NEW BRITAIN	089
		NEW HAVEN	090
		NEW LONDON	096
		NORWALK	091
		SOUTHINGTON	097
		STAMFORD	092
		WATERBURY	093
		WILLIMANTIC	098
DELAWARE	10	WILMINGTON (NEW JERSEY)	106
DIST. OF COLUMBIA	11	WASHINGTON, D.C. (MARYLAND, VIRGINIA)	796
FLORIDA	12	BRADENTON	107
		BREVARD COUNTY (MELBOURNE, ROCKLEDGE, COCOA BEACH, TITUSVILLE)	124
		DAYTONA BEACH	110
		DE FUNIAK SPRINGS	817
		FORT LAUDERDALE	111
		FORT MYERS	122
		FORT PIERCE	820
		GAINSVILLE	816
		JACKSONVILLE	112
		LAKELAND	119
		MARIANNA	818
		MIAMI	113
		MILTON	819

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STATE	STATE CODE	URBAN AREA	URBAN CODE
FLORIDA (cont.)		NAPLES	822
		OCALA	823
		ORLANDO	114
		PENSACOLA	115
		PLANT CITY	120
		PUNTA GORDA-PORT CHARLOTTE	109
		SANFORD	125
		SARASOTA	121
		ST. PETERSBURG	116
		STUART	821
		TALLAHASSEE	123
		TAMPA	117
		VENICE	108
		WEST PALM BEACH	118
GEORGIA	13	ALBANY	137
		ATLANTA	126
		AUGUSTA	127
		COLUMBUS	136
		CORDELE	130
		COVINGTON	131
		DALTON	132
		DOUGLASVILLE	139
		LA GRANGE	140
		MACON	128
		NEWNAN	840
		PERRY	134
		ROSSVILLE (CHATTANOOGA,TN.)	601
		SAVANNAH	129
		TIFTON	135
		VALDOSTA	138
HAWAII	15	HONOLULU	791
		KAILUA	793
		MOKAPU	794
		WHIAWA	792
IDAHO	16	BLACKFOOT	148
		BOISE	141
		CALDWELL	142
		COEUR D'ALENE	143
		IDAHO FALLS	144
		MERIDIAN	150
		MOUNTAIN HOME	149
		NAMPA	146
		POCATELLO	147
		POST FALLS	151
ILLINOIS	17	BELVIDERE	155
		BENTON	161
		BLOOMINGTON	162
		CAIRO	164
		CHAMPAIGN-URBANA	156
		CHICAGO (ELGIN)	157
		DANVILLE	165
		DECATUR	172

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STATE	STATE CODE	URBAN AREA	URBAN CODE
ILLINOIS (cont.)		EAST ST. LOUIS (ST.LOUIS,MO.)	338
		EDWARDSVILLE	830
		EFFINGHAM	179
		GALESBURG	167
		GENESEO	180
		GRAYSLAKE	152
		JOLIET	158
		KANKAKEE	168
		MARION	178
		MATTOON	173
		MORRIS	174
		MT. VERNON	175
		OTTAWA	176
		PEORIA	159
		PERU	153
		PONTIAC	828
		RANTOUL	177
		ROCK ISLAND-MOLINE (DAVENPORT,IA.)	196
		ROCKFORD	827
		ROMEOVILLE	829
		SALEM	154
		SPRINGFIELD	160
		VANDALIA	170
		WEST FRANKFORT	171
INDIANA	18	ANDERSON	185
		CHICAGO (ILLINOIS-INDIANA)	157
		COLUMBUS	189
		CRAWFORDSVILLE	190
		ELKHART-GOSHEN	194
		EVANSVILLE	187
		FORT WAYNE	181
		INDIANAPOLIS	182
		LAFAYETTE	188
		LEBANON	186
		RICHMOND	192
		SEYMOUR	193
		SHELBYVILLE	191
		SOUTH BEND	183
		TERRE HAUTE	184
IOWA	19	AMES	199
		ANKENY	204
		CEDAR RAPIDS	202
		CLEAR LAKE	205
		DAVENPORT (ROCK ISLAND-MOLINE, ILLINOIS)	196
		DES MOINES	197
		DUBUQUE	206
		IOWA CITY	200
		NEWTON	201
		OMAHA (IOWA-NEBRASKA)	372
		SIOUX CITY (SOUTH SIOUX CITY, NEBRASKA-SOUTH DAKOTA)	198
		WATERLOO-CEDAR FALLS	203
KANSAS	20	ABILENE	213
		EMPORIA	214

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STATE	STATE CODE	URBAN AREA	URBAN CODE
KANSAS (cont.)		GOODLAND	219
		JUNCTION CITY	220
		LAWRENCE	215
		NEWTON	216
		OLATHE	217
		SALINA	218
		TOPEKA	211
		WICHITA	212
KENTUCKY	21	BEREA	229
		BOWLING GREEN	225
		CORBIN	223
		ELIZABETHTOWN	226
		LEXINGTON	221
		LOUISVILLE	222
		MOREHEAD	228
		PADUCAH	224
		RICHMOND	230
		WILLIAMSBURG	835
		WINCHESTER	227
LOUISIANA	22	ALEXANDRIA	241
		BATON ROUGE	231
		BOSSIER CITY	847
		KENNER	243
		LAFAYETTE	238
		LAKE CHARLES	232
		METAIRIE	244
		MONROE	233
		NEW ORLEANS	234
		OPELOUSAS	242
		PONCHATOULA	245
		RAYNE	240
		RUSTON	236
		SHREVEPORT	235
		SLIDELL	237
		SULPHUR	239
MAINE	23	AUGUSTA	247
		BANGOR	248
		PORTLAND	246
		SACO	249
		WATERVILLE	250
MARYLAND	24	ANNAPOLIS	258
		BALTIMORE	256
		FREDERICK	257
		HAGERSTOWN	259
		LAUREL	260
		WASHINGTON,D.C. (VA-D.C.)	796
MASSACHUSETTS	25	AMESBURY	273
		BOSTON	266
		FALL RIVER	267
		FITCHBURG-LEOMINSTER	279
		FRANKLIN	274

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STATE	STATE CODE	URBAN AREA	URBAN CODE
MASSACHUSETTS (cont.)		GREENFIELD	275
		LAWRENCE	268
		LOWELL	269
		MARLBOROUGH	276
		MIDDLEBORO	280
		MILFORD	277
		NEW BEDFORD	270
		NEWBURYPORT	278
		PROVIDENCE (RHODE ISLAND)	571
		SPRINGFIELD	271
		TAUNTON	281
		WORCHESTER	272
MICHIGAN	26	ANN ARBOR	286
		BATTLE CREEK	296
		BAY CITY	287
		BENTON HARBOR	297
		CHARLOTTE	302
		COLDWATER	298
		DETROIT	288
		FLINT	289
		GRAND RAPIDS	290
		HOLLAND	304
		HOWELL	303
		JACKSON	291
		KALAMAZOO	292
		KINCHELOE	305
		KINROSS	307
		LANSING	293
		MARSHALL	306
		MONROE	299
		MUSKEGON	294
		PORT HURON	300
		SAGINAW	295
		SAULT STE. MARIE	301
MINNESOTA	27	ALBERT LEA	316
		AUSTIN	313
		DULUTH (SUPERIOR, WI.)	311
		FARGO (MN,ND)	476
		FARIBAULT	314
		MINNEAPOLIS (ST.PAUL)	312
		OWATONNA	315
		WORTHINGTON	317
MISSISSIPPI	28	BILOXI	329
		BROOKHAVEN	330
		FOREST	333
		GULFPORT	322
		HATTIESBURG	332
		JACKSON	321
		LAUREL-ELLISVILLE	323
		McCOMB-SUMMIT	324
		MERIDIAN	325
		MOSS POINT	326
		PICAYUNE	327

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STATE	STATE CODE	URBAN AREA	URBAN CODE
MISSISSIPPI (cont.)		SOUTH HAVEN (MEMPHIS, TN.)	603
		VICKSBURG	328
		WINONA	331
MISSOURI	29	BLUE SPRINGS	350
		BOONVILLE	348
		CARUTHERSVILLE	353
		CHARLESTON	349
		COLUMBIA	340
		CRYSTAL CITY	341
		JOPLIN	342
		KANSAS CITY	336
		LEBANON	343
		PERRYVILLE	352
		ROLLA	344
		SIKESTON	351
		SPRINGFIELD	339
		ST. JOSEPH	337
		ST.LOUIS (E. ST. LOUIS, IL.)	338
		SULLIVAN	347
MONTANA	30	BILLINGS	356
		BOZEMAN	358
		BUTTE	359
		GLENDIVE	360
		GREAT FALLS	357
		HELENA	361
		LAUREL	364
		LIVINGSTON	362
		MISSOULA	363
NEBRASKA	31	KEARNEY	374
		LINCOLN	371
		NORTH PLATTE	373
		OMAHA	372
		SIOUX CITY (S.SIOUX CITY, IA-SD)	198
NEVADA	32	ELKO	383
		LAS VEGAS	381
		RENO	382
NEW HAMPSHIRE	33	CONCORD	392
		DERRY	396
		LEBANON	393
		MANCHESTER	391
		PORTSMOUTH	394
		SALEM	395
NEW JERSEY	34	NEW YORK (NY-NJ)	429
		PHILADELPHIA (BURLINGTON,NJ-PA)	549
		PHILLIPSBURG	402
		TRENTON	401
		WILMINGTON (DE-NJ)	106
NEW MEXICO	35	ALBUQUERQUE	411
		DEMING	412

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STATE	STATE CODE	URBAN AREA	URBAN CODE
NEW MEXICO (cont.)		GALLUP	413
		GRANTS	414
		LAS CRUCES	415
		LAS VEGAS	416
		RATON	417
		SOCORRO	418
		TUCUMCARI	419
NEW YORK	36	ALBANY-SCHENECTADY-TROY	426
		AMSTERDAM	433
		BATAVIA	857
		BATH	448
		BEACON	434
		BINGHAMTON	427
		BUFFALO	428
		CATSKILL	858
		CORTLAND	435
		DANSVILLE	450
		DUNKIRK	436
		ELMIRA	447
		GLENS FALLS	445
		KINGSTON	438
		MIDDLETOWN	446
		NEW YORK	429
		NEWBURGH	439
		ONEIDA	440
		ONEONTA	444
		PLATTSBURGH	441
		ROCHESTER	430
		SARATOGA SPRINGS	442
		SYRACUSE	431
		UTICA	432
		WATERTOWN	443
		WAVERLY	449
NORTH CAROLINA	37	ASHEVILLE	451
		BURLINGTON	457
		CHARLOTTE	452
		DUNN	472
		DURHAM	453
		GASTONIA	458
		GREENSBORO	454
		HENDERSON	459
		HENDERSONVILLE	471
		HICKORY	460
		HIGH POINT-THOMASVILLE	455
		KANNAPOLIS	461
		LUMBERTON	462
		MORGANTON	470
		NEWTON-CONOVER	469
		OXFORD	468
		RALEIGH	466
		ROANOKE RAPIDS	467
		SALISBURY	463
		SMITHFIELD	465
		STATESVILLE	464

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STATE	STATE CODE	URBAN AREA	URBAN CODE
NORTH CAROLINA (cont.)		WINSTON-SALEM	456
NORTH DAKOTA	38	BISMARCK	477
		DICKINSON	482
		FARGO-MOORHEAD	476
		GRAND FORKS	481
		JAMESTOWN	478
		MANDAN	479
		VALLEY CITY	480
OHIO	39	AKRON	486
		CANTON	487
		CINCINNATI	488
		CLEVELAND	489
		COLUMBUS	490
		DAYTON	491
		DOVER	497
		ELYRIA-LORAIN	492
		FINDLAY	498
		LIMA	493
		MANSFIELD	499
		MARIETTA	500
		MIDDLETOWN	507
		PIQUA	501
		SIDNEY	502
		SPRINGFIELD	494
		TOLEDO	495
		TROY	505
		WAPAKONETA	506
		WHEELING (W.VA.)	753
		YOUNGSTOWN-WARREN	496
		ZANESVILLE	504
OKLAHOMA	40	ARDMORE	516
		CHICKASHA	525
		CLINTON	513
		EL RENO	864
		ELK CITY	517
		GUTHRIE	519
		HENRYETTA	514
		LAWTON	524
		MIAMI	523
		OKLAHOMA CITY	511
		PAULS VALLEY	520
		PERRY	515
		SALLISAW	521
		SAPULPA	863
		SHAWNEE	866
		TULSA	512
		VINITA	522
		WEATHERFORD	518
		YUKON	865
OREGON	41	ALBANY	528
		ASHLAND	536
		BAKER	529

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STATE	STATE CODE	URBAN AREA	URBAN CODE
OREGON (cont.)		COTTAGE GROVE	537
		EUGENE	526
		GRANTS PASS	538
		LA GRANDE	539
		MEDFORD	531
		ONTARIO	532
		PENDLETON	533
		PORTLAND	527
		ROSEBURG	534
		SALEM	535
		THE DALLES	530
		WOODBURN	540
PENNSYLVANIA	42	ALLENTOWN-BETHLEHEM	546
		BLOOMSBURG	554
		CANONSBURG	555
		CARLISLE	556
		CHAMBERSBURG	563
		DuBOIS	564
		EASTON	557
		ERIE	547
		HARRISBURG	548
		MONESSEN-CHARLEROI	559
		PHILADELPHIA	549
		PITTSBURGH	550
		SCRANTON-WILKES BARRE	551
		SOMERSET	562
		STROUDSBURG-E.STROUDSBURG	560
		WASHINGTON	561
		YORK	553
RHODE ISLAND	44	PROVIDENCE	571
SOUTH CAROLINA	45	CHARLESTON	581
		COLUMBIA	582
		FLORENCE	585
		GAFFNEY	587
		GREENVILLE	583
		ROCK HILL	584
		SPARTANBURG	586
SOUTH DAKOTA	46	BROOKINGS	593
		MITCHELL	594
		RAPID CITY	592
		SIOUX FALLS	591
		SPEARFISH	596
		STURGIS	595
TENNESSEE	47	ATHENS	879
		CHATTANOOGA (ROSSVILLE,GA.)	601
		CLEVELAND	606
		COOKEVILLE	607
		DYERSBURGH	880
		FRANKLIN	877
		HARRIMAN	612
		JACKSON	608

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STATE	STATE CODE	URBAN AREA	URBAN CODE
TENNESSEE (cont.)		KINGSPORT	609
		KNOXVILLE	602
		LA VERGNE	889
		LANOIR CITY	888
		LEBANON	611
		MANCHESTER	613
		MEMPHIS (SOUTH HAVEN,MS.)	603
		MORRISTOWN	610
		MURFREESBORO	614
		NASHVILLE	604
		NEWPORT	876
		ROCKWOOD	615
		SMYRNA	878
TEXAS	48	ABILENE	616
		AMARILLO	617
		AUSTIN	618
		BEAUMONT	619
		BELTON	632
		BIG SPRING	633
		COLORADO CITY	634
		CONROE	635
		CORPUS CHRISTI	620
		CORSICANA	636
		DALLAS-FORT WORTH	621
		DENTON	637
		EL PASO	622
		ENNIS	638
		FORT STOCKTON	663
		GAINESVILLE	639
		GALVESTON	624
		GEORGETOWN	640
		GREENVILLE	641
		HILLSBORO	642
		HOUSTON	625
		HUNTSVILLE	643
		KERRVILLE	662
		LAREDO	626
		LONGVIEW	644
		LUBBOCK	657
		MARSHALL	645
		MIDLAND	627
		MONAHANS	646
		MT. PLEASANT	647
		NEW BRAUNFELS	648
		ODESSA	628
		ORANGE	649
		PECOS	650
		PLAINVIEW	658
		SAN ANTONIO	629
		SAN MARCOS	651
		SEGUIN	660
		SULPHUR SPRINGS	652
		SWEETWATER	653
		TEMPLE	654
		TERRELL	655

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STATE	STATE CODE	URBAN AREA	URBAN CODE
TEXAS (cont.)		TEXARKANA (ARKANSAS)	630
		VIDOR	661
		WACO	631
		WAXAHACHIE	656
		WEATHERFORD	659
UTAH	49	AMERICAN FORK	679
		CEDAR CITY	680
		LEHI	685
		OGDEN	676
		PAYSON	684
		PROVO-OREM	677
		RICHFIELD	686
		SALT LAKE CITY	678
		SPANISH FORK	682
		ST. GEORGE	681
VERMONT	50	BRATTLEBORO	691
		BURLINGTON	692
		MONTPELIER	693
		ST. JOHNSBURY	694
		WHITE RIVER JUNCTION	695
VIRGINIA	51	BLACKSBURG	715
		BLUEFIELD (W.VA.)	755
		BRISTOL (TENN)	710
		CHARLOTTESVILLE	716
		CHRISTIANSBURG	719
		CLIFTON FORGE	711
		COVINGTON	712
		HOPEWELL	717
		MARION	713
		NEWPORT NEWS	706
		NORFOLK	707
		PETERSBURG-COLONIAL HEIGHTS	714
		RICHMOND	708
		ROANOKE	709
		WASHINGTON, D.C. (D.C., MD.)	796
		WYTHEVILLE	718
WASHINGTON	53	BELLINGHAM	729
		CHEHALIS	730
		ELLENSBURG	744
		EVERETT	732
		KELSO	733
		MOSES LAKE	735
		MOUNT VERNON	736
		OLYMPIA	737
		PASCO-KENNEWICK	743
		PORTLAND (ORE.)	527
		RICHLAND	742
		SEATTLE	726
		SPOKANE	727
		TACOMA	728
WEST VIRGINIA	54	BECKLEY	760

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STATE	STATE CODE	URBAN AREA	URBAN CODE
WEST VIRGINIA (cont.)		BLUEFIELD (VA.)	755
		CHARLESTON	751
		CLARKSBURG	756
		FAIRMONT	761
		HUNTINGTON	752
		MARTINSBURG	762
		MORGANTOWN	757
		PARKERSBURG	754
		PRINCETON	758
		WHEELING	753
		WILLIAMSON	759
WISCONSIN	55	BELOIT	774
		DULUTH-SUPERIOR (MN.)	311
		EAU CLAIRE	882
		GREEN BAY	770
		HUDSON	775
		JANESVILLE	772
		LaCROSSE	768
		MADISON	766
		MANITOWOC	881
		MENOMONIE	769
		MILWAUKEE	767
		OSHKOSH	771
		SHEBOYGAN	773
		SPARTA	883
WYOMING	56	CASPER	776
		CHEYENNE	777
		EVANSTON	786
		GILLETTE	782
		GREEN RIVER	784
		LARAMIE	778
		RAWLINS	779
		ROCK SPRINGS	780
		SHERIDAN	781
		WHEATLAND	783

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Field 8. Mileage Increment — Column 22

Mileage Increment	Code
42,500-mile System	1
Howard-Cramer Amendment	2
Section 139, Title 23, U.S.C. (nonchargeable)	3

Field 9. Route Significance — Column 23

Route Significance	Code
National Significance	N
Local Significance	L

Field 10. Design Speed (V) MPH — Columns 24,25

Speed	Code
50	50
55	55
60	60
65	65
70	70

etc.

Field 11. Base Year Traffic — Columns 26,27,28,29,30,31

1984 ADT

Code only one figure in each field; if a range is shown, code the higher figure.

Traffic	Code
3,425	003425
26,570	026570
135,100	135100

etc.

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Field 12. Traffic

Design Year (line 8a)	Columns 32,33
Year	Code
1975	75
1987	87
1989	89
2000	00
2001	01
2005	05

etc.

A design year zero must be coded and keypunched in columns 32 and 33. The field cannot be left blank. Zeros in this field indicate a design year of 2000.

Field 13. Design Year ADT (line 8b) Columns 34,35,36,37,38,39

Traffic	Code
2,550	002550
25,555	025555
130,221	130221

etc.

Field 14. Design Year DHV (line 8c) Columns 40,41,42,43,44

Traffic	Code
3,845	03845
11,260	11260

etc.

Field 15. Design Year D, Directional Distribution Factor (line 8d) Columns 45,46

Percentage Factor	Code
53	53
67	67

etc.

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Field 16. Design Year T, Percent Trucks DHV (line 8e) — Columns 47,48

Percent Trucks	Code
3	03
6	06
12	12

etc.

Field 17. Design Year T, Percent Trucks ADT (line 8f) — Columns 49,50

Percent Trucks	Code
3	03
6	06
11	11

etc.

Field 18. Number of Lanes to be Constructed This Estimate — Columns 51,52

No. of Lanes	Code
4	04
6	06
10	10

etc.

Field 19. Ultimate Number of Through Traffic Lanes at Completion of Program — Columns 53,54

No. of Lanes	Code
4	04
6	06
10	10

etc.

NOTE: "Typical cross-section" reference (line 11) on Table B is coded and keypunched in field 22a (columns 67-74) if the Table B print program is used.

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Field 20. Right-of-Way Width

Prevailing Width Width, feet	Columns 55,56,57,58 Code
80	0080
150	0150
225	0225
300	0300
1200	1200

etc.

Field 21. Median Width

Prevailing Width Width, feet	Columns 59,60,61,62 Code
4	0004
16	0016
100	0100
1200	1200

etc.

Field 22. Status of Development (PR-511)

Status	Code	Columns 63,64,65,66
1a(1)f	1A1F	
1a(1)f*	1A1F 1/	
1b(1)f*	1B1F 1/	
6b(1)	6B10	
4a(1)	4A10	
3a(1)s	3A1S	

1/ Omit coding and punching Asterisk for Status 1a(1)f* and 1b(1)f*. Code and punch as shown.

Note: For programming purposes, toll segments in Status 6a are to be included and coded as 6b(3).

Field 22a. Typical Section Cross Reference Columns 67-74

Any typical section number may be coded and keypunched into these 8 columns in any position within the columns. It is suggested that the reference be coded in the middle of the columns so it will print in the middle of the estimate section column on Table B. Any combination of letter or numbers is permissible by the program.

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Card 2, Bottom Half Table B

Cost by Work Classification

Lines 1 through 10

Field 1.

Card Identification	Column 1
Card No.	Code
2	2

Field 2 through 5.

Identification data "State" through "Finance Code" — Columns 2-14

The identifying data to be coded and keypunched in Columns 2 through 14 on Card 2, should be identical to that coded and keypunched on Card 1 for each record.

Cost by Work Classification, Lines 1 through 10 — Columns 15-72

Fields, 23, 26, 27, 28, 29, 30, 31 and 33 (five column fields).

Cost for each of lines 1, 3, 4, 5, 6, 7, 8 and 10 is to be coded and keypunched in a 5 column field, right justified.

Cost ($1000)	Code
75	00075
750	00750
36,750	36750

etc.

Fields, 24, 25 and 32 (six column fields).

Cost for lines 2a, 2b and 9 is be coded and keypunched in a 6 column field.

Cost ($1000)	Code
995	000995
8,995	008995
75,995	075995
101,995	101995

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Card 3, Bottom Half Table B

Cost by Work Classification

Lines 11 through 19

Field 1.

Card Identification	Column 1
Card No.	Code
3	3

Fields 2 through 5.

Identification data "State" through "Finance Code" — Columns 2-14

The ID data to be coded and keypunched in Columns 2 through 14 on Card 3, should be identical to that coded and keypunched on cards 1 and 2.

Cost by Work Classification, Lines 11 through 19 — Columns 15-65

Fields 37 and 38 (four column fields).

a. Cost for lines 14a and 14b is to be coded and keypunched in a 4 column field.

Cost ($1000)	Code
48	0048
248	0248
3,248	3248

etc.

Fields 34, 35, 36, 39, and 41 (five column fields).

b. Cost for each of lines 11, 12, 13, 15 and 17 is to be coded and keypunched in a 5 column field.

Cost ($1000)	Code
65	00065
265	00265
4,265	04265
24,265	24265

etc.

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Fields, 40, 42 and 43 (six column fields).

c. Cost for lines 16, 18 and 19 is to be coded and keypunched in a 6 column field.

Cost ($1000)	Code
23	000023
423	000423
5,423	005423
15,423	015423
315,423	315423

etc.

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General Notes

1. Urban area codes listed on pages A-9 through A-21 of this Appendix must be used. If a required urban area and code has been omitted from the list, a code number should be requested from the Washington Office of the Federal Highway Administration, HNG-13, at 426-0404.

2. Where overcapacity situations arise (cost to be keypunched exceeds the size of field specified), the estimate section should be divided into two smaller sections and coded and keypunched under two separate mileposts. Mileage and cost should be divided accordingly.

3. Code and keypunch route number as specified on page A-6 of this Appendix. Unless the official route number contains a N-E-W-S designation, column 7 on the card should be keypunched zero (0).

4. The PR-511 milepost replaces the alphanumeric estimate section number used in pre-1979 estimates. The milepost is purely numeric and should be coded and keypunched right justified. (See instructions on page A-7 of this Appendix.)

5. An estimate section may have two or more columns of data in Table B due to differing finance codes (double coded section) as discussed in Section IV of the Instruction Manual and pages A-6 and A-7 of this Appendix. In such cases a full set of three (3) cards is required for each column (each finance code). Data for each column must be complete and must be keypunched into the cards. In most cases, the data on Card No. 1 is identified with the exception of the finance code and section length.

6. The Traffic Design Year must be keypunched in Columns 32 and 33 of each record (Card 1). It cannot be left blank. Zeros in these columns indicate a design year of 2000.

7. The data on tape, cards, or diskette, should be submitted to the Washington Headquarters of FHWA (HNG-13) as soon as they are available. Do not hold them while the estimate is being printed.

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APPENDIX B

GUIDE FOR

DEVELOPING RIGHT-OF-WAY AND RELOCATION COSTS

FOR THE

1987 INTERSTATE COST ESTIMATE

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Right-of-Way and Acquisition

General

The estimate is to include costs of all eligible and remaining right-of-way needs. The individual items or elements comprising the total acquisition estimate are identified and discussed below.

Property Estimates

1. Property estimates, both urban and rural, shall be made on a parcel by parcel basis.

2. Estimates should be made by a qualified appraiser under supervision of the State highway department. Costs should be estimated on the basis of values prevailing at the time the State's estimate is prepared. Do not add a rate, percentage, adjustment, or other additive to anticipate an increase or decrease in value for future years. The estimates should include the costs of all lands required for right-of-way including improvements thereon, access rights, severance damages, consequential damages, if applicable, and any other generally compensable costs payable for the acquisition. Buildings and other improvements should be estimated on the basis that the State will acquire the title thereto. No attempt should be made to guess or determine whether the owner would want to keep his improvements and not transfer title to the State. Tenant owned improvements shall be estimated as if they were part of the reality to be acquired. If there is any doubt about a remnant being classed as uneconomic, it should be estimated as though it would be acquired. The owner should not be contacted.

3. To the extent practicable, property estimates should be accumulated in a manner for easy reference. Sales prices may be obtained from a central source normally used and need not be verified with the buyer or seller for the purpose of this estimate.

4. The appraiser is not required to view the interior of either the comparables or the improvements to be taken. The property estimate shall identify the improvements to be taken, if any, and shall identify the comparables used to arrive at each estimated value. Support shall be supplied for data used in the cost approach when this approach is chosen. Except for the time element, some property estimates used in the 1985 estimate may still be applicable. Such estimates may be used as a base and a supported factor added to bring the amounts up to prices current at the time this estimate is made.

5. Where it has been determined that a functional replacement of publicly owned lands and/or improvements will probably take place, estimates of the cost to replace should be based upon a supported cost estimate utilizing the State's cost manuals, such as Marshall Valuation Services.

Incidental Expense

1. The amount included in the estimate for right-of-way incidental costs should be the result of multiplying the total number of Interstate parcels in each estimate section by the dollar amount per parcel completed in accordance with the paragraphs that follow.

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2. This item shall include the cost of incidental expenses connected with the Interstate right-of-way acquisition such as surveys, economic studies, title evidence, appraisals, negotiations, closing and escrow services, court costs, witness fees, recording fees, etc., and amounts reimbursed to owner of acquired properties for recording fees, transfer taxes and similar conveyance fees, penalty costs for prepayment mortgages, and prorated taxes. The incidental expenses should also include the litigation expenses of the type provided for in Section 304 of the Uniform Relocation Assistance and Land Acquisition Policies Act 1970 (Public Law 91-646) (42 U.S.C. 4601). If the State normally does not incur this type of expense, of course no amount need be included. Eligible acquisition costs would include those which are directly chargeable to a project such as for salaries, transportation, and related expenses of employees while working on a project. Supervisory and overhead costs not directly chargeable to projects and not normally reimbursable with Federal funds should be excluded from the estimate. The amounts used should be for items that are ordinarily reimbursable from Federal funds. Payments made to displaced persons for moving and other relocation costs shall not be included as part of the acquisition incidental expenses. Likewise, the cost of providing relocation assistance services shall not be included as part of the acquisition incidental expenses. Both items shall be handled in accordance with procedures contained in the relocation portions of the manual.

3. The costs for the items referenced in paragraph 2 above should be accumulated preferably for the last 2 calendar years or at the States' election, the last 2 fiscal years, or the preceding 24 months. If a State does not have an adequate record for any item of incidental cost for the 2-year period, it should estimate in the best manner possible the costs for the item for a 2-year period and such amount shall be included in the total eligible incidental expenses. The basis for such estimate shall be part of the State's file.

4. The total of the State's Interstate incidental expenses for the 2 years should be divided by the number of Interstate parcels for which acquisition was completed during the same 2 years, (i.e., through negotiation, administrative settlement and final court settlement or awards) to arrive at a dollar amount per period. Care must be used, however, to be sure that the costs of the past 2 years are relevant to the parcels remaining to be acquired. In the event that the Interstate costs for the 2-year period are not representative, the dollar amount per parcel may be developed from Statewide experience. As indicated above in paragraph 2, the items used should be those generally eligible for Federal participation.

5. The basis for determining the number of parcels acquired during the past 2 years and the number of parcels remaining to be authorized after December 31, 1985, shall be part of the estimate record.

Awards and Settlements

1. Court Awards and Legal Settlements

   a. The cost estimate shall include an estimate of the amount by which anticipated court settlements and court or other condemnation awards will exceed the fair market value amount estimated by the review

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appraiser. The estimate should be based on a percentage rate developed separately for urban and rural work from the State's experience during the past 2 years. To develop the rate, the State should first determine the Interstate parcels for which condemnation settlements or awards were final during the past 2 years, separately for urban and rural. The difference between the total amount of such settlements or awards separately for urban and rural and the total amount of the reviewer's estimate of fair market value, for each classification should be determined. Such difference shall be divided by the total amount of the reviewer's estimate of fair market value of all Interstate parcels for each classification acquired during the same 2-year period through both normal negotiation settlement, and condemnation. Such developed rate shall be applied to the total property estimate for all remaining parcels in each urban or rural estimate section.

b. If the amounts of the awards for the remaining parcels are expected to be different from the experiences record of the past 2 years, a judgmental factor should be added to take care of the difference. Similarly, if the 2-year experience record includes an unusual property of a type which will not be acquired in the future, it should be removed from the experience record before the rate is developed. The reasoning and computation shall be supported in the file. If the increase in awards varies in different areas of the State, the rate may be developed by areas in which the remaining parcels are to be estimated.

c. The records of the actual cost and related figures for the past 2 years shall be a part of the file record to support the estimate.

2. Administrative Settlements

a. If a State makes administrative settlements before condemnation is filed, the estimate should include an amount for the estimated increase in cost.

b. The amount should be estimated in a manner similar to that provided for court awards using those parcels which were finally settled administratively during the past 2-year period. The difference between the total amount settled administratively and the reviewer's estimate of fair market value for the same parcels should be determined. The increase should be divided by the total fair market valued for all Interstate parcels acquired through negotiation, settlement, and condemnation during the same period. The developed rate would be applied to the total estimated property acquisition costs for all remaining parcels included in the estimate section.

3. Optional Method for Rate Development

a. In developing the above factors, it is possible that the right-of-way or accounting records of the States for the past 2 years may be such that a great amount of work would be required to separate the parcels settled administratively from those acquired through condemnation settlement or award. In such instances, all parcels acquired during

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the last 2 years may be separated into rural and urban categories. The difference between the review appraiser's estimate of fair market value of all parcels in each category and the amount paid for the these parcels should then be divided by the total of the review appraiser's estimate of fair market value of all parcels in each category. The resulting rural and urban rates would be applied to the total property estimate of all remaining parcels which are to be included in the particular estimate sections.

b. If the developed statewide urban rate for these increases is not representative of the increase in a specific urban area, an experience rate should be developed, if possible, for that area and be applied to the applicable estimate sections.

c. The rural sections should be handled similarly where the statewide rural rate might not be representative in specific rural areas.

Right-of-Way Clearance

Costs for demolition and clearing of major improvements and obstructions are to be estimated and reported on Line 2a except as noted the discussion for Line 4 in Section VI of this manual.

Demolition costs should be developed on a parcel by parcel basis but a different method may be used where there are a series of improvements of similar size, use and general value. Estimates for demolishing improvements should be based on recent contracts let for demolishing similar properties.

For the purpose of this estimate, it shall be assumed that all improvements will be demolished or cleared and no consideration should be given to the possibility that the State might be able to sell the improvements to someone else who would remove them.

The basis for developing this portion of the estimate shall be documented in the States' records.

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Relocation Payments and Services

General

The estimate is to include the costs of payments and services to be provided under 42 U.S.C. Sections 202, 203, 204, 205, and 206 of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), for moving of personal property, sale and rental replacement housing, mortgage interest differentials and closing costs incurred in the purchase of replacement property, relocation services and, where necessary, providing of replacement housing as a last resort. The estimate is expected to be prepared by experienced right-of-way or relocation assistance personnel, with support and documentation available in the State workpapers.

Parcel by parcel estimates are to be made to the extent that individual parcel information is available regarding family size and income, room count, personal property involved, etc. Since all States now have the full authority to implement the provisions of the Uniform Act and most States have been making the necessary payments for some time, the estimate for most of the items will be available from the State experience record. Each State is expected to develop and document an average cost figure for each of the relocation cost elements. However, where a State has little or no actual experience record, the estimate must be based on projected amounts taking into consideration the factors included below.

In addition to the normal moving costs and replacement housing payments, consideration should be given to any increased costs in these categories as a result of appeals by the relocatees. This increase could be a computed amount derived from the experience record of the State. If little or no information is available on a State basis, regional or other comparable data may be substituted in the computation and made a part of the State workpapers.

The estimated amount for relocation will be supported under each of five headings: Moving personal property, replacement housing, mortgage interest differential, closing costs incurred in purchase of replacement housing and relocation services cost. The moving costs are to be separated for families, businesses, farms and nonprofit organizations; the replacement housing payments separated as to owners and tenants. Cost of providing (building, if necessary) replacement housing will be supported in a separate category.

Moving Costs

For moving costs for families, for each parcel estimate, the State should use either the average amount based on its past experience of actual cost moves, or the State moving expense schedule, if such amounts are considered to fairly represent the cost of future family moves. There appears to be little reason to deviate from the average of the schedule, unless an overall increase can be expected in the moving cost payment. The State may use the overall State average, the average actual moves or the average of the schedule moves (including the dislocation allowance). Any deviation on a parcel from these average cost figures must be explained.

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For business, farms and nonprofit organizations, the experience record of the State should be used as the basis for the moving cost estimates in these categories. As for family moves any deviation from the State average must be explained.

Large or uncommon farms, businesses, plants, and nonprofit organizations should be considered individually. Experienced employees will have to make the estimates or several sample bids could be obtained to provide information on which to base these moving costs.

Since a $2,500 minimum payment is authorized for in lieu payments and also for in lieu payments to nonprofit organizations there should be some consideration for this factor.

In estimating the searching costs for each farm, business and nonprofit organization, the State should use a $500 lump-sum amount unless some other amount can be shown as being more representative.

If, in a particular State, the overall State moving cost average for one or more of the categories is not considered reliable for some reason, the State must develop an average for the category. Sample bids or estimates should be obtained from moving companies or other reliable sources as a basis for the estimate amount.

Replacement Housing Payments -- Owner-Occupants

Payments for replacement housing to owner-occupants should be based on the experience record of the State. If a sufficient number of payments have been made by a State since enactment of its own relocation law, that average should be the basis for the cost item in this category.

Where the State does not have an adequate experience record on which to base its estimate, then it should, by using overall general guidelines established by FHPM 7-5-1, RELOCATION ASSISTANCE, make studies of different homogeneous areas through which the project runs to estimate whether generally replacement housing is available at the acquisition prices to be paid in the area.

Once the basic determination is made, an average replacement housing payment for owner-occupants should be established for the number to be displaced by the project in the specific area. The basis of the State's computation shall be part of the estimate file.

There should be available in the State records sufficient experience data to be used to arrive at the mortgage interest differential to be used in the estimate. Adjustments may be necessary to reflect current interest rates and other economic factors, but generally this State average would be the basis for the amount. When data are lacking, the State should utilize experience data from another State or used regional data, which adjustment for local economic factors.

Another method would be to make a survey or an adequate representative sampling of acquisitions of dwellings during the past 2 years to determine the average acquisition price and average for: (1) unpaid mortgage amount; (2) length of remaining mortgage; (3) mortgage interest rate, and (4) monthly principal and

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interest payment. An average interest rate for new mortgages should be obtained from a sampling of savings and loan firms and other housing mortgage outlets. The average increase in monthly principal and interest payment would then be discounted at an average prevailing interest rate paid on savings deposits by commericial banks in the general areas in which the replacement dwelling would probably be located. The average discount rate may be on a statewide basis or area basis if variations exist between different sections of the State. The estimated increased interest cost payment due an owner-occupant may be shown either as a percentage factor or an individual monetary computation if the factor would not apply in certain isolated instances.

Points may also be a factor in an area when considering the increased interest payment. When points are involved, the charge may be added in a lump-sum to the increased interest cost payment. The points are not to be added in computing the new interest rate.

The procedures for determining an increased interest payment is shown in FHPM 7-5-4, REPLACEMENT HOUSING PAYMENTS. The new format for computation of an interest payment is shown in FHPM 7-5-4 as Attachment 1. This format is self-explanatory.

It must be remembered, however, that all properties do not have a mortgage and that in different areas the number of properties mortgaged will vary. If the increased interest factor is used on a statewide basis, this factor must be considered.

The State files shall be documented to indicate the method used to arrive at the average interest differential payment and how the differential was applied to the projects to be estimated.

Closing costs to be incurred in connection with the purchase of replacement housing by an eligible owner-occupant will be shown as a separate item in the State's estimate files. This expense may be shown as a percentage factor based on information obtained through a survey or sampling of mortgage firms and/or title companies as to the normal closing costs incurred. In most instances, however, the experience record of the State should be utilized to arrive at the closing cost item. Adjustments or deviations from the statewide average must be supported.

Replacement Housing Payments -- Tenants

The basis for estimating the replacement housing payments to tenants should also be the experience record of the State. If a sufficient number of payments have not been made to establish a creditable average, the average payment of the State should be adjusted based on regional or other average and explanation provided in the State files.

The experience record of the State should also be utilized to reflect a factor for downpayments, including closing costs. There should be an adjustment indicated to reflect the increased number of tenants who purchase using the downpayment category. Points (buyers) or loan organization fee should be included as part of the downpayment.

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Relocation Services

The estimate of the cost of providing relocation services should have as a basis the average actual parcel cost to the State over the past 2 years of providing all relocation assistance services (excluding payments) to eligible displaced persons. If no actual records of such costs are available, experienced State personnel familiar with relocation assistance shall supply the backup data and documentation to arrive at the services cost. The rate may be developed on either a parcel or project basis.

Even though the States have been providing the required services, the Uniform Act provides for many increased services, especially in regard to economic studies or surveys for available replacement housing, etc., so that there may be additional costs which the State has not yet experienced. In development of the rate, considerations should be given to the number and types of additional personnel required to perform the anticipated services.

Eligible costs would include those which are directly chargeable to a project such as for salaries, transportation and related expenses of relocation personnel while working on a project; cost of advertising and/or listing services; cost of contracted assistance services; salaries and other costs of computation of the moving cost and replacement housing payments; costs related to services provided to persons occupying property immediately adjacent to property acquired; costs related to the establishment and maintenance of project offices; the expenses of persons utilized in the inspection of decent; safe and sanitary replacement housing; costs related to the exchange of information and coordination with other agencies, and so forth.

Replacement Housing (As a Last Resort)

There may be projects where comparable replacement sale or rental housing will not be available in sufficient quantity, or within the financial means of the people to be displaced. In these instances, the State will be required to include the estimated cost of providing (building, if necessary) the replacement housing.

The State should consider whether it will be able to provide the replacement housing within the limits of Sections 203 and 204 of the Uniform Act either by owner retention or rehabilitation of nondecent, safe and sanitary available housing, particularly for owner-occupants. For tenants, mobile homes or other innovative methods may be proposed. In these cases, the State should include sufficient information and data in the form of a brief preliminary housing study to support the estimated cost.

For those projects where the cost of providing the replacement housing will exceed the $15,000 and $4,000 payment limits, the State should provide a brief replacement housing plan and include such data as how and where the housing will be provided and any other data pertinent to providing the replacement housing. The estimate should include the basis of the computation and the costs for any or all of the following:

(1) The acquisition price of land and/or dwellings, and costs incidental thereto

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(2) Moving of houses

(3) Site development

(4) Architect and engineering fees

(5) Landscape planting

(6) Rehabilitation

(7) Construction of new housing

(8) Reasonable legal fees and expenses

(9) Other reasonable expenditures necessary to produce dwelling units which are compatible with other dwellings in the neighborhood in which they are constructed and acceptable to the general real estate market.

(10) Any direct costs of providing 206(a) housing including administrative costs incurred by a State highway department, political subdivision or local public agency.

In some locations the replacement housing may be made available through the purchase of existing housing at a cost in excess of the payment limits of the Uniform Act. As an alternate method, the State may estimate the cost of purchasing the replacement housing and include the total cost under this category. Care should be taken, however, that this cost does not exceed the cost of construction of such housing.

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